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## Editorial

I'm delighted to introduce the first issue of *Greek and Roman Musical Studies*. There has previously been no journal devoted to research in Greek and Roman music and musicology, comparable, for instance, to those that focus on ancient philosophy, history or literature. In view of the striking revival of interest in music-related issues among classical scholars in recent decades, I think that the time for such an enterprise is ripe.

The inspiration for it emerged from discussions between members of The International Society for the Study of Greek and Roman Music and its Cultural Heritage, informally and more conveniently known as Moisa (see [www.moisa-society.org](http://www.moisa-society.org)). In a sense it 'belongs' to the Society, but it is not merely our in-house journal, and it is not intended to be the exclusive preserve of scholars who would regard themselves as specialists in ancient musicology. Music is a topic that crosses all our disciplinary boundaries; it has important relevance in areas as diverse as philosophy, mathematics, the natural sciences, poetry and literature in general, social and political history, iconography, archaeology, papyrology and many more. *GRMS* will welcome contributors—and of course readers—whose principal interest is in any of these fields, or in others. We are also very happy to receive contributions on the music of other ancient cultures in the Mediterranean area, and on the ways in which Graeco-Roman music and musical thought influenced those of later civilisations.

It's a special privilege for us to be able to include in our first issue a set of seven papers, by highly-regarded experts in several disciplines, on the contents of the fifth-century 'Musician's Grave' and an associated burial, found in Athens in 1981. The Musician's Grave contained, among other things, the remains of three musical instruments (an aulos, a lyre and a harp), together with a partly legible papyrus roll and four writing-tablets, on one of which some writing is preserved; the papyrus and the tablets are of considerable significance in their own right, since they are the earliest such items to have been discovered in mainland Greece. The associated grave contained a group of *lekythoi*, which give unambiguous evidence about the date of the burials. Despite the discovery's importance, reflected in newspaper articles at the

time, the graves' contents have not previously been thoroughly examined and published.

Pöhlmann's paper describes the site of the excavation, the nature and disposition of the graves' contents when they were found and the history of their subsequent treatment. The special techniques used to detect details invisible to the naked eye are explored in the paper of Alexopoulou and Kaminari. Simon and Wehgartner's paper on the *lekkythoi* shows that the burials can be securely dated to 430 BC or very shortly thereafter (which agrees exactly with conclusions reached independently by Terzēs). West discusses the papyrus roll and the two writing-tablets, giving details of the fragmentary remnants of words and letters, and offering suggestions about their interpretation. The physical details of the aulos (and of the lyre, of which very little survives) are examined by Psaroudakēs. Terzēs analyses the features of the harp, whose state of preservation allows it to be reconstructed in detail. Hagel's paper, the last of this group, explores the pitching and tonal structure of the better-preserved instruments, the aulos and the harp.

The authors of these articles have cooperated with one another extensively, and there are many cross-references, especially to illustrations. We have therefore adopted a consistent system of numbering for illustrations. Each is given a Roman numeral, followed by an Arabic numeral and sometimes a letter. The Roman numerals are keyed to the order in which the articles appear in this issue; the Arabic numerals (with or without additional letters) indicate particular images. Thus e.g. 'II 6a' refers to Plate 6a in the second article in the issue.

The papers in the second part of this issue display something of the diversity of areas in which musicological questions can arise. Bettini examines the sound-patterns of early Latin ritual formulae and their links with those of musical expression; Vendries discusses Hellenistic and Roman-period Egyptian terracotta figurines of musicians, and the information they give us about religious and domestic practices; LeVen considers the meanings of a Greek word, often used in musical contexts, which is poised enigmatically between the realms of audible sound and visible colour; and Raffa investigates the parameters of a debate, recorded by the Neoplatonist philosopher Porphyry in his commentary on Ptolemy's *Harmonics*, about the uses of terms belonging on the one hand to mathematics and on the other to musical theory. At first sight the authors' topics and their fields of expertise could hardly be more different; it is their relevance to the study of ancient music that provides the connecting thread.

The inauguration of *GRMS* and the production of its first issue have involved a great deal of work to which many people have contributed. I would like to



record my thanks to all my colleagues on the Editorial Board for the help they have given me, especially to Egert Pöhlmann, who inspired and coordinated the work on the Musician's Grave, to Eleonora Rocconi and Donatella Restani, who prompted and encouraged my first approaches to our publishers, and to Linda Woodward for giving us the benefit of her skills as a copyeditor. We also owe a major debt to our publishers, Brill, for welcoming this initiative, and to the members of their staff—Irene van Rossum, Marjon Jekel, Michael J. Mozina and Karen Cullen—who have guided us expertly and with remarkable patience through the mysteries involved in bringing it to fruition.

Andrew Barker

## Excavation, Dating and Content of Two Tombs in Daphne, Odos Olgas 53, Athens<sup>1</sup>

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### Abstract

On 13. and 14. May 1981, in the course of emergency excavations in Odos Olgas 53 in Daphne, Athens, two tombs were excavated, the second of which was heralded as the Tomb of the Musician by the press. The contents were transferred to the National Archaeological Museum and later, after restoration, to the Archaeological Museum of Piraeus. In Tomb I there were found the bones of an adult person in his or her 40s, together with four *lekythoi*, which can be dated by their shape and the style of the paintings to about 430 B.C. In Tomb II there were found the bones of a young adult in his or her early 20s, together with toys, tools, a writing case with stylus and inkpot, fragments of a papyrus scroll and five leaves of two different wooden note-books (*polyptycha*), together with the remains of a lyre, a harp and one tube of a pair of *auloi* with mouthpiece. On the papyrus fragments and the *polyptycha* scanty remains of writing in the Ionian alphabet can be read. Some mythical names point to poetry; musical notation, alleged by the inventory books to be detectable, could not be seen. The harp is an example of the type called the 'spindle harp', which is represented on vase pictures from 430 to 410.

Il 13 e 14 maggio del 1981, nel corso degli scavi di emergenza ad Odos Olgas 53, nel sobborgo di Dafne ad Atene, furono scavate due tombe: la seconda tra queste fu annunciata dalla stampa come la Tomba del Musicista. I contenuti furono trasferiti al Museo Archeologico Nazionale e in seguito, dopo il restauro, al Museo Archeologico del Pireo. Nella Tomba I furono trovate le ossa di un adulto/a sui quarant'anni assieme a quattro *lekythoi*, databili intorno al 430 a.C. sulla base della loro forma e dello stile delle pitture. Nella Tomba II furono trovate le ossa di un giovane adulto/a sui vent'anni, assieme a giocattoli, strumenti, una cassetina per scrittura con stilo e inchiostro, frammenti di un rotolo di papiro e cinque fogli di due diverse tavolette in legno (*polyptycha*), assieme ai resti di una lira, un'arpa e una canna da una coppia di *auloi* con imboccatura. Sui frammenti papiracei e sui *polyptycha* si possono leggere ridottissimi resti di scrittura in alfabeto ionico. Alcuni nomi mitici fanno pensare a un contesto poetico; non è possibile leggere alcuna

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<sup>1</sup> A preliminary version of this paper was published, together with the paper of Martin West below, in Pöhlmann and West 2012. We thank the editor of *ZPE*, Dr. Rudolf Habelt GmbH, Bonn, for his kind permission to publish the substance of this paper again.

notazione musicale, come originariamente supposto dai libri d'inventario. L'arpa rappresenta la tipologia della cosiddetta 'arpa a fuso', rappresentata sulle pitture vascolari dal 430 al 410.

### Keywords

Papyrus (fifth century B.C.), polyptycha, ancient Greek music, Greek musical notation, Greek instruments, 'Musician's Tomb'

## 1. Excavation of the Tombs, Restoration and Transfer of the Content to the Archaeological Museum of Piraeus

'Greek artist's grave yields rare papyrus': this was the heading of an article by the Athenian correspondent of *The Times* on 25 May 1981.<sup>2</sup> The next day there appeared in Athens a well-informed report by Michael Gerakis headed "Ἀρχαῖος ποιητῆς ὁ νεκρὸς μετὰ τὸν πάπυρο καὶ τὴ λύρα".<sup>3</sup> The so called 'Grave of the musician' (tomb II) was found, together with a second grave (tomb I), in the course of an emergency excavation caused by road construction in Daphne, directed by the Ephoros responsible for Attica, Vasilios Petrakos. The excavation itself was carried out by his colleague Angelos Liankouras, who published the official report in the *Deltion*.<sup>4</sup> The tombs are part of a burial area which has been known since the nineteenth century.<sup>5</sup>

Tomb I was excavated on 13 May 1981. According to the thorough report of Aggelos Liankouras it contained a cist-grave measuring 1.95 m in length, 0.93 m in width and 0.9 m in height, constructed from five marble slabs for the bottom and the sides and two more for the lid. It contained an adult skeleton and four lekythoi. The collaborator of Liankouras was Janna Drakotou, later director of the Ephoria B until 2010. In November 2011 she delivered to us a photo from 1981, which shows tombs I and II side by side, each of them covered with two marble slabs measuring 0.975 m × 0.93 m. Thus it became clear that there was no gabled roof, as we had assumed in Pöhlmann and West (2012), 1. On the following day, in the immediate neighbourhood, tomb II was excavated, with exactly the same construction, material and dimensions. It contained an adult skeleton, remains of a papyrus roll, and miscellaneous other objects (see plate I 1). The close relationship of the two tombs suggests a family burial (see Plate I 11). It is a great pity that no stele was found to give us their names.

<sup>2</sup> See Modiano 1981.

<sup>3</sup> See Gerakis 1981.

<sup>4</sup> Liankouras 1981; see also Touchais 1982, 533; Cockle 1983, 147.

<sup>5</sup> M. Gerakis (n. 3): Στην περιοχή αυτή έχει εντοπιστεί αρχαίο νεκροταφείο από το 1830 που άρχισαν οι πρώτες ανασκαφές.

The remains of the papyrus roll, described in *The Times* as ‘a shapeless, flattened mass’,<sup>6</sup> were transferred on 14 May to the National Archaeological Museum (see plate I 2). The rest of the finds from both tombs followed on 22 May.<sup>7</sup> There is a substantial report by Konstantinos Asimenos, the chemist of the National Archaeological Museum, who was telephoned on the afternoon of 14 May 1981 by the excavator, Angelos Liankouras, told of the discovery of tomb II and the papyrus, and asked to go and give immediate help.<sup>8</sup> He found that in consequence of the high humidity in the tomb the papyrus had decayed into a formless mass.<sup>9</sup> He removed it from the tomb and transferred it to the chemical department of the National Museum, where it was kept under high humidity to prevent further disintegration. On a separate small piece of 3×4 cm in better condition, compacted from fragments of several layers (presumably from the outside of the roll), several partial lines of text could be seen. On 19 and 20 May Asimenos took a series of good photographs of this piece,<sup>10</sup> which is now, after restoration, ΜΠ 8523 in the Piraeus Museum (see plate II 8 a /b; IV 11).

The Director of the Bronzes Department of the National Museum, Angeliki Lempesi, had told the Director of the Museum on 18 May that no restorer of papyri was to be found in the Museum itself, in the Archaeological Service, or in the National Gallery and National Library in Athens. She proposed asking the appropriate departments of the British Library or the Österreichische Nationalbibliothek in Vienna for advice, and this was done on the same day. But on 21 May the conservation department of the National Museum nominated a painter and restorer, Antonios Glinos, for the job of restoring the papyrus, and on 22 June the Ministry of Culture charged him with the task.<sup>11</sup>

Meanwhile, on 19 May, Peter Lawson, a conservation officer in the Department of Oriental Manuscripts and Printed Books in the British Library, having read a report by Liankouras, had sent some preliminary advice on glassing the

<sup>6</sup> See n. 2.

<sup>7</sup> National Archaeological Museum, Athens (= subsequently: NatMus), Inventory 21, 23/6/93–29/6/93, nos. 27005–27112; Βιβλίο Εισαγωγής (= subsequently: BE) 42.29/1981.

<sup>8</sup> NatMus BE 29/1981, 19 May 1981: report of K. Asimenos to the director of the National Museum.

<sup>9</sup> Επρόκειτο πράγματι για αρχαίο πάπυρο, τελείως αποσπασμένο, που είχε μετατραπεί σε άμορφη μάζα.

<sup>10</sup> NatMus BE 29/1981, 19/20 May 1981: notice of K. Asimenos.

<sup>11</sup> NatMus BE 29/1981, 21 May 1981: report of A. Lempesi to the Director of the National Museum; BE 29/1981, 22 June 1981: letter of Nikolaos Yalouris, Ministry of Culture, to the archaeological authorities.

papyrus.<sup>12</sup> In June he went to Athens to see it for himself. There is an interesting report by him on its condition.<sup>13</sup> He estimated the size of the original roll at 12 cm in height by 3 cm diameter. He found that ‘one end has been totally eroded away into a sand/earth mass. At first sight it would appear to be a total loss. But closer investigation under an approx  $\times 3$  illuminated glass shows that fragments from the one end of the scroll to be [*sic*] recoverable.’ He went on to give detailed advice on dealing with the fragments, the most important point being the alignment of the individual fragments: ‘When it is absolutely sure of the fragments relative position [*sic*], a plan to be prepared with the fragments correctly aligned, a sheet of glass placed over the top of the plan and the fragments fixed in position as described to the conservation staff, using pressure sensitive tissues on the back of each frag.’

Lawson had the opportunity to discuss the problems of the papyrus with Lempesi, Glinos, Asimenos, and other colleagues. There was evidently no consensus on how to proceed. In writing to Lempesi on 7 July Asimenos pointed out that the papyrus, being soaked and rotten, could not be treated like a normal dry papyrus. ‘The proposals of the English conservator are proposals for the conservation of a stable (not a rotten) papyrus, which are absolutely excluded in the given case’.<sup>14</sup> Glinos supported him, and the Director of the Museum accepted their views and rejected Lawson’s advice.<sup>15</sup>

In his letter to Lempesi Asimenos argues that the fragments could not be removed from the roll without first being fixed: ‘The conservator is compelled to fix the fragments *in situ*, as they are otherwise destroyed in the process of removal and transfer. Only after fixation may he detach the fragments’.<sup>16</sup> In his final report at the conclusion of the restoration Glinos gives further information about the procedure followed.<sup>17</sup> To avoid any pressure on the fragments he made frames which kept two sheets of glass 0.5 cm apart. The lower

<sup>12</sup> NatMus BE 29/1981, 19 June 1981: letter of P. Lawson to A. Lempesi; 2 May 1981: report of A. Liankouras.

<sup>13</sup> NatMus BE 29/1981, 17 June 1981: report of P. Lawson for A. Lempesi.

<sup>14</sup> NatMus BE 29/1981, 7. July, report of A. Glinos to A. Lempesi: Οι προτάσεις του Άγγλου Συντηρητή είναι προτάσεις συντήρησης γερού (όχι σάπιου) παπύρου, που στην συγκεκριμένη περίπτωση αποκλείονται τελείως.

<sup>15</sup> NatMus BE 29/1981, 23 July 1981, statement of A. Glinos to the Director of the National Museum; BE 29/1981, 27 July, report of Dr. Olga Alexandri to the Ministry of Culture.

<sup>16</sup> As in n. 14: Η αφαίρεση των κομματιών χωρίς προηγούμενο φιάρισμα δεν είναι δυνατή πάντα. Ο συντηρητής αναγκάζεται να φιξάρει επί τόπου τα κομμάτια που τρίζονται κατά τη μετακίνηση και ύστερα να τα αφαιρέσει.

<sup>17</sup> NatMus BE 29/1981, 3 March 1982: report of A. Glinos to the Director of the National Museum, Dr. Olga Alexandri.

sheet was covered with silk, on which the fragments were glued. In the Piraeus Museum there are eight such frames, containing innumerable tiny fragments of the papyrus. It appears that Glinos detached the fragments piece by piece and attached them to the silk, keeping joins where possible, but not always preserving their original relative positions. Consequently no continuous text appears anywhere. Sometimes he was unable to separate the compacted layers of papyrus and left the respective fragments untouched, as can be seen at the bottom of frame 1, where there remains a large fragment of  $4.5 \times 3$  cm, 3 mm thick (see plate IV 6). The same is true of frame 3, which is an untouched large fragment of  $9 \times 4.5$  cm, 4 mm thick (see plate II 3b). Restoration of the finds was completed on 3 March 1982.<sup>18</sup> A proposal on 5 May 1982 to transfer them to the Archaeological Museum of the Piraeus was not implemented because of a lack of equipment.<sup>19</sup> So they remained in the deposits of the National Museum, until on 1 February 1996, at the request of the Ephoros Georg Steinhauer,<sup>20</sup> they were transferred to the Piraeus Museum,<sup>21</sup> where the most interesting objects are now exhibited in room 2 on the first floor,<sup>22</sup> while the bulk of the finds is preserved in the store-room.

By kind permission of the Director of the Ephoria 26 in the Piraeus, Eutychia Lykouri, and the Director of the Archaeological Museum in Piraeus, Cornelia Axioti, Martin West and Egert Pöhlmann were able to study the originals in the exhibition and in the store-room from 2 June 2010. Mrs. Angeliki Poulou copied for us the detailed descriptions in the inventory book, and Mrs. Tatiana Panagopoulou supplied important additional information. Egert Pöhlmann, by the friendly permission of Director Dr. Rosa Proskynitopoulou and the help of Christina Avronidaki, was able to study from 4 June 2010 all the remaining material in the Bronzes Department of the National Archaeological Museum in Athens related to the finds in the Daphne tombs, namely reports, correspondence, and the aforesaid photographs made in 1981 before the restoration of the material.<sup>23</sup>

By the kind intercession of the Ephoros of the Piraeus, Director Dr. Alexandros Mantis, we obtained on 19 August 2011 the formal permission of the

<sup>18</sup> NatMus BE 29/1981, 3 March 1982: notice of the restorer, Antonios Glinos.

<sup>19</sup> NatMus BE 29/1981, 5 May 1982: notice of Director Dr. Olga Alexandri-Tsachou; 30 June 1982, notice of the Ephoros Dr. Vasilios Petrakos.

<sup>20</sup> NatMus BE 29/1981: 30 January 1996, notice of the Ephoros Georg Steinhauer.

<sup>21</sup> NatMus BE 29/1981: 1 February 1996, deposition of Niki Prokopiou, National Museum, and Cornelia Axioti, B' Ephorate of Prehistoric and Classical Antiquities.

<sup>22</sup> See Steinhauer 1998, 35–44, esp. 42.

<sup>23</sup> NatMus BE 29/1981 and file: Τάφο του μουσικού in BE 29/1981 (= subsequently: TombMus).

Athenian Ministry of Culture (ΥΠΠΟ) to study, photograph and publish the material relating to the two tombs. On 22 September 2011 Prof. Athena Alexopoulou (Technological Educational Institution of Athens) began photographing the relevant objects in the Piraeus Museum, using high resolution digital photography and multispectral photography. Having established independent teams for questions of Archaeology, Archaeometry, Papyrology, Musicology and Anthropology, we received on 20.12.2011 the permissions for each of these teams. This is a report on the state of our research.

## 2. Contents and Date of Tomb I

Tomb I contained, according to the report of Angelos Liankouras,<sup>24</sup> only a skeleton and four lekythoi.<sup>25</sup> From the skeleton there remain parts of the ribs, arms, fingers and legs, the *sternum*, and nearly all of the spine, namely 20 of the 24 *vertebrae* including the *epistropheus* (see plate I 3). The skull itself was saved by the excavators, but has not yet been found again. There are also substantial remains of the pelvis, namely the *os sacrum*, and the hip-bones, and finally parts of the *femora*. After having studied photographs Prof. Dr. Winfried Neuhuber, the Director of the Institut of Anatomy at the University of Erlangen, observed that the junctures between the elements of the *sternum* (see plate I 4a) and the *os sacrum* (see plate I 4b) are already completely ossified. Thus he has been able to establish that the deceased was in middle age, probably in his or her forties. As far as the sex of the deceased is concerned, the bones of the pelvis are not as decisive as we might want.

The four lekythoi (see plates II 13a-18d; III 1a-d, 2a-d) give a clue to the date of the burial. They exhibit, in different states of preservation, figures painted in matt colours on white ground, the style of which, together with the shape of the vessels, points to a date of 430 BCE.<sup>26</sup>

## 3. Contents and Date of Tomb II

On 14 May 1981, before the finds from tomb 2 were removed, a drawing of the tomb was made (see plate I 1), together with two lists of the contents

<sup>24</sup> See n. 4.

<sup>25</sup> Archaeological Museum in Piraeus (subsequently PiMus), 9<sup>ο</sup> Ευρετήριο Αρχαιολογικού Μουσείου Πειραιά (subsequently Ευρετήριο), ΜΠ 4721/4724.

<sup>26</sup> See the paper of Erika Simon and Irma Wehgartner below.

(see plates I 9-10),<sup>27</sup> which indicate by numbers the material (wood, iron etc.) and the position of the items in the tomb. On the drawing there can be seen, besides the skeleton, the frame of a harp (no's 11-12, 14-15), a writing-case (13), an ink pot (20), fragments of a tortoise shell (28, 31, 33), a saw (30), knucklebones (32), an aulos tube with mouthpiece (46, 46A), four leaves of a polyptychon (47), a papyrus roll (47A), a chisel (49) and a stylus (50). There are also several other objects, which are not identified.

The skeleton in tomb II is better preserved than the one in tomb I, as may be seen already in the drawing. There are parts of the skull (see plate I 5a), the right temple with the auditory passage and the upper jaw with teeth (see plate I 5b). Besides many remains of the arms, hands, legs, ribs there is the *sternum*. Parts of the spine remain: there are 12 of the 24 *vertebrae* and the *epistropheus*. Above all, there are again important parts of the pelvis: the *os sacrum*, the hip bones and the *femora*. Finally, there are both knee-joints. Prof. Neuhuber pointed to the excellent condition of the teeth and observed that the ossification of the junctures of the elements of the *sternum* (see plate I 6a) and the *os sacrum* (see plate I 6b) was only in its beginnings. Thus he advises us that the deceased was a young adult in his or her early twenties. The state of the bones of the pelvis is not as decisive as we might want. DNA analysis is needed in order to establish the sexes of the two people in tomb I and II, their family relationship and perhaps the reason for their deaths.

The gifts that accompanied the dead person in tomb 2 make a curious assortment. There are nine knucklebones (see plate I 7a), seven of bone (MII 7450) and two of copper (MII 7451 A), perhaps toys from the deceased's childhood. Then come tools: a chisel (MII 7444; see plate I 7b) and a saw (MII 7446; see plate I 8a), both of iron.

Another group of objects points to a person who was well acquainted with the art of writing. There is a writing-case (MII 7456, see plate I 8b) containing the bronze stylus (MII 7443) and a bronze ink-pot (MII 7445). Four wooden writing tablets (MII 7452-5)<sup>28</sup> and fragments of a fifth (MII A 27047) belong to two different wooden notebooks, discussed in the paper of Martin West below. The first of them shows remnants of yellow wax on the front side, the second of them has reddish wax on the front and back of three leaves. Finally there was a papyrus roll, which had been found complete (see plate I 2), but has now

<sup>27</sup> See NatMus BE 29/1981 TombMus.

<sup>28</sup> MII 7452-7455 are in the exhibition; the fragments of the fifth leaf are kept separately in the store-room.



disintegrated into innumerable fragments. These are kept in eight frames,<sup>29</sup> also discussed in the paper of Martin West.

The deceased was a musician, as three musical instruments indicate: a tortoise shell (MPI 7457) that must have been the soundbox of a lyre (see plate V 11), a well-preserved tube of an aulos with mouthpiece (MPI 7447/8; see plate II 2 a–c) and fragments of a harp<sup>30</sup> (MPI 7458; see plates II 1 a–c). In a paper presented on 30 October 2010 to the International Conference ‘Poetry, Music and Contests in Ancient Greece’ in Lecce, Chrestos Terzes offered a convincing reconstruction of this instrument (see his paper below).<sup>31</sup> It is without doubt the ‘spindle harp’ type,<sup>32</sup> which is depicted on vases between 430 and 410 BCE. This helps to establish the dating of tomb 2, which matches well with the dating of the lekythoi of tomb 1 to 430/20 BCE.

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<sup>29</sup> MPI 7449 (in the exhibition), 8517–8523 (in the store-room).

<sup>30</sup> C. Terzes, letter of 13 December 2010.

<sup>31</sup> C. Terzes, ‘The harp from the “Tomb of the Poet” in Daphni, Athens’.

<sup>32</sup> See Wegner 1949, 204 and Tafel 23; Paquette 1984, 190, 195 figs. H1, H2, 201 fig. H13; Maas and Snyder 1989, 152–4, 161 fig. 11 B, 164 figs. 16–17; West 1992, 72 and pl. 22.

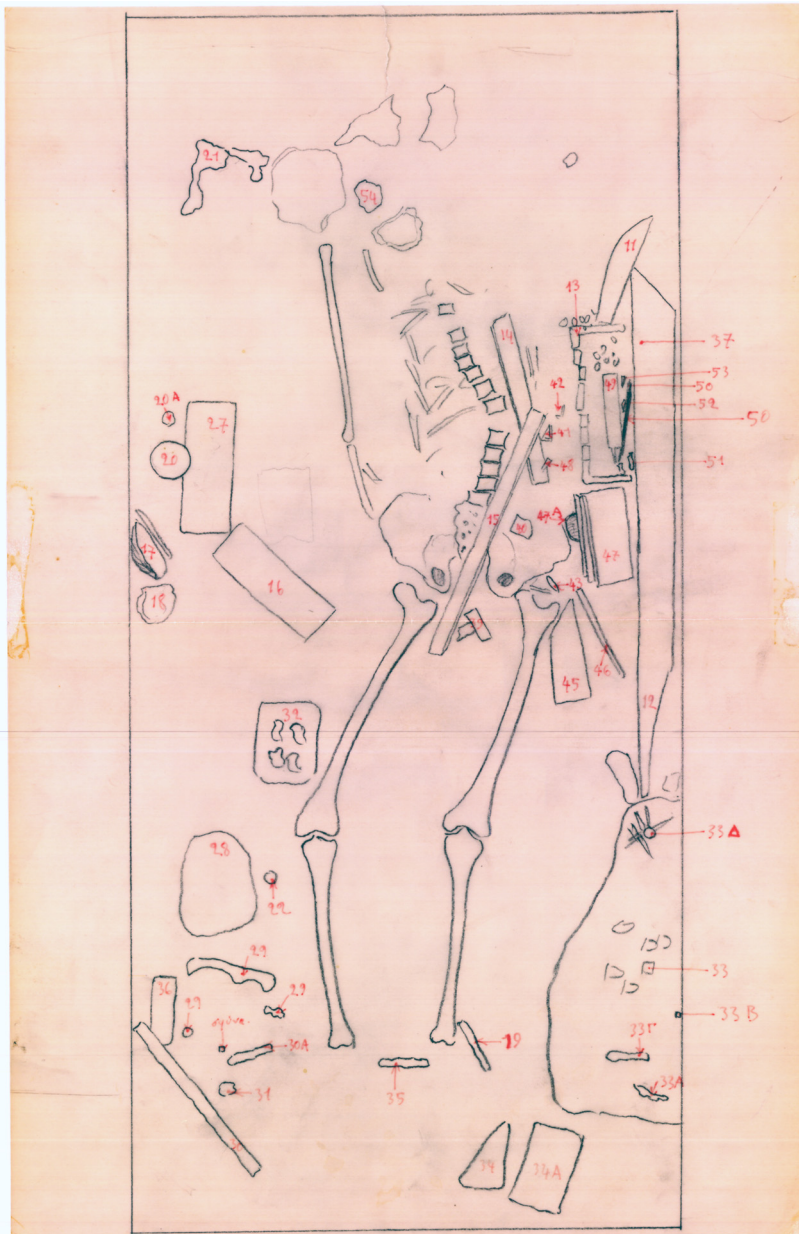


Plate I 1. Design of Tomb II after Excavation.

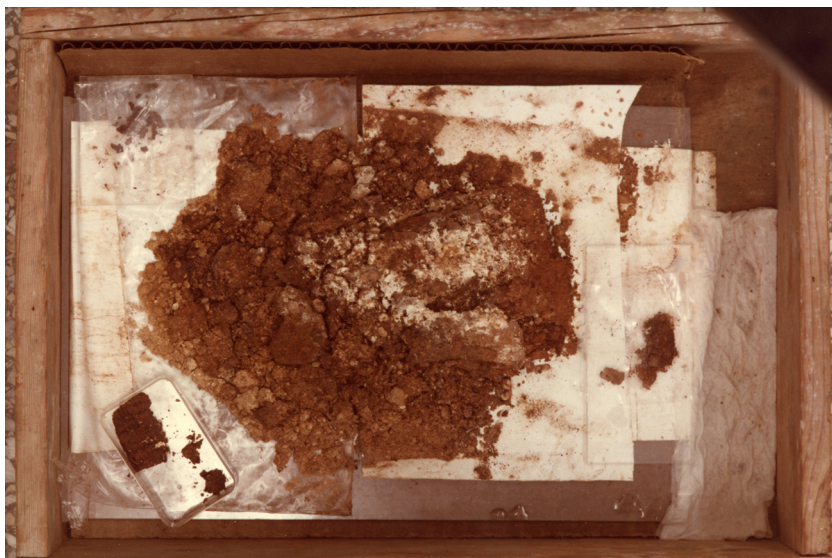


Plate I 2. Papyrus of Tomb II before Restoration.



Plate I 3. Spine from Tomb I.





Plate I 4a. Sternum from Tomb I.



Plate I 4b. Os sacrum from Tomb I.



Plate I 5a. Part of Skull from Tomb II.



Plate I 5b. Jaw with teeth from Tomb II.



Plate I 6a. Sternum from Tomb II.



Plate I 6b. Os sacrum from Tomb II.





Plate I 7a. Astragaloi from Tomb II (MPI 7450-7451 A).



Plate I 7b. Chisel from Tomb II (MPI 7444).

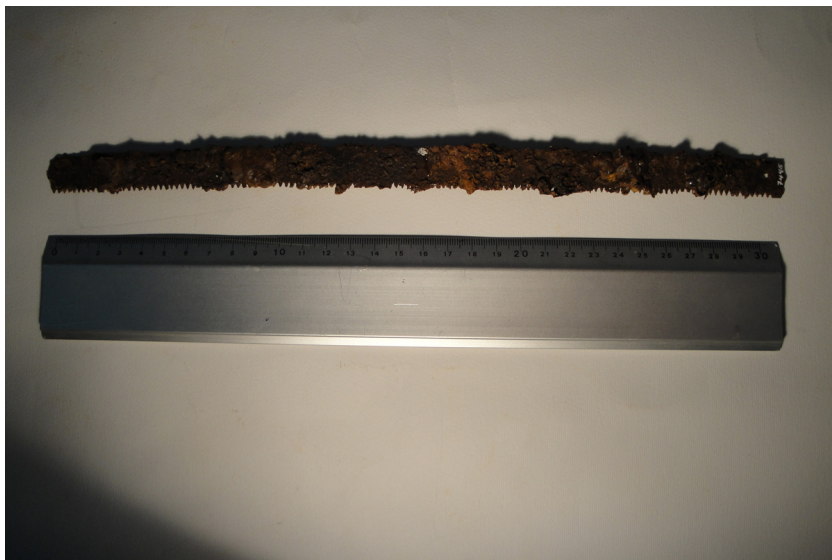


Plate I 8a. Saw from Tomb II (MII 7446).



Plate I 8b. Writing Box, Pen, Ink Pot from Tomb II (MII 7456, 7443, 7445).



<u>ὑψηλὴ κατὰ ὄμαδος</u>			
<u>ὑψα</u>	<u>ὑψο με βιβρο</u>	<u>ὑψο + βιβρο + ὑψα</u>	
11 ← καὶ χαλκινὰ κορυφαία	20 <sup>a</sup>	29	
12 12 <sup>a</sup> , 12 <sup>b</sup> , 12 <sup>γ</sup>	25	54	
← καὶ χαλκινὰ κορυφαία	27	↑	
14	30 <sup>a</sup>	2 Δ Ε = 54	
15	35	3 Δ Ε	
19	21		
24	25		
36		<u>ὑψο + βιβρο</u>	
39		34 34 <sup>a</sup>	
40	<u>ὑψο + ἐξαρτοστών</u>		
41	12 <sup>a</sup>		
8 42		<u>ἐξαρτοστών</u>	
46, 46 <sup>a</sup>		22	
47, 47 <sup>a</sup>	<u>βιβρο</u>	52	
53	21	37	
13	30	33 <sup>δ</sup>	
<u>χαλκός</u>	49		
11 ἀποχρὺν χαλκ. κορυφαία στο ὑψο 11	33 <sup>a</sup> , 33 <sup>b</sup> , 33 <sup>γ</sup>		
20	27		
48	32 (2 αἰῶνι τὸ κορυφαίον)		
50			
54			
12 χαλκ. ἐξαρτοστών στο ὑψο 12			
		<u>ἵχνη ισοφύρας</u>	
		38	
<u>Κορυφαία ἀπο κορυφ. χεῖρας</u>			
26 28			
31 33			

Plate I 9. List 1 of findings in Tomb II.

# Διαφορά ὑπικά αὐτοῦ καραβο

Ξυλο 11 Ε, 10 Ζ, 8 Ζ, 5 ΣΤ, 4 ΣΤ  
 2 Δ, Ε } και τα 4 πράγματα (κατω αὐτοῦ  
 3 Δ, Ε } κίθαρι-βιολο) πῶρον ἀρ. ὁμάδας 54

Ξυλο + βιολο 11 ΣΤ, 9 Ε  
 >> + >> + ὑβασμα → 9 Δ  
Ξυλο + βιολο 10 ΣΤ, 9 ΣΤ και 7 ΣΤ

Δέρμα (;) 10 ΣΤ, 9 ΣΤ.

Δέρμα + ὑβασμα 6 Ζ

Βυζα Βυζών + μίχαν αὐτοῦ ὑβασμα 9 Ζ, 6 Δ, 6 Ε,  
 6 ΣΤ, 5 Δ, 5 Ε,  
 5 ΣΤ, 5 Ζ

Οἶτα 11 Ε, 11 ΣΤ, 11 Ζ, 8 Δ, 7 Δ, 7 Ε, 6 Δ,  
 6 Ε, 6 ΣΤ, 6 Ζ, 5 Δ, 5 Ε, 5 ΣΤ,  
 5 Ζ, 4 Δ, 4 Ε, 4 ΣΤ, 4 Ζ

Plate I 10. List 2 of findings in Tomb II.



Plate I 11. Tombs I and II during excavation.

# Multispectral Imaging Documentation of the Findings of Tomb I and II at Daphne

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## Abstract

A selection of the findings of Tombs I and II was examined using non-invasive multispectral imaging in visible and near-infrared radiation. This led to increased legibility of the text for several fragments of papyrus including underlayers, better distinction of script on tablets and better visualization of the drawings and pigment differentiation on the lekythoi.

Alcuni oggetti scelti tra quelli ritrovati nelle tombe I e II sono stati esaminati utilizzando la tecnica non invasiva delle immagini multispettrali con radiazioni di banda visibile e vicino infrarossa. Ciò ha permesso di ottenere una migliore leggibilità del testo di diversi frammenti di papiro (inclusi gli strati interni), una maggiore nettezza della scrittura sulle tavolette e infine una più chiara visualizzazione delle figure e delle diverse pigmentazioni sulle lekythoi.

## Keywords

Multispectral imaging, papyrus, false colour infrared, lekythos, tablet

## 1. Introduction

Multispectral Imaging is a non-invasive method of investigation, which allows the simultaneous collection of spectral and spatial information of a surface, thus extending the capabilities for diagnostic imaging and has proven to be a useful technique for both conservation scientists and conservators. Primarily used for scientific investigation of paintings it has also been successfully applied to the study of documents, the evaluation of conservation treatments and digital imaging for documentation.<sup>1</sup> The first time that imaging spectroscopy was applied to archaeological documents was on the Dead Sea Scrolls,<sup>2</sup>

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<sup>1</sup> Padoan *et al.* 2008, 1; Fischer *et al.* 2006, 7; Chabries *et al.* 2003, 362; Bearman *et al.* 1996, 57.

<sup>2</sup> Chabries *et al.* 2003, 362.



where a near infrared electronic imager was developed to acquire the spectral response of this material to infrared radiation (IR). It was already known through infrared photography<sup>3</sup> that old manuscripts, especially carbon based inks, became more legible to infrared imaging. The Petra Scrolls,<sup>4</sup> the Archimedes Palimpsest,<sup>5</sup> the scrolls of Herculaneum<sup>6</sup> are the most representative cases of the utility of multispectral imaging to read ancient indiscernible or faded manuscripts. Thus the application of multispectral imaging combined with false colour technique to the papyrus and the other findings of the Tomb I in Daphne was appropriate not only because of the significance of these findings but also because of their state of preservation.

The fundamentals of spectral imaging are based primarily on the interaction of light with matter. When a photon is incident on a surface of a material energy can be absorbed, transmitted and/or reflected by the surface with a wavelength dependency determined by the material properties. Spectral reflectance depends not only on the scattering properties of the material under investigation but also on the characteristics of the illumination, the incident and scattering angles and the sensitivity of the detector. Thus, a surface viewed in the infrared presents different optical behaviour from the same one viewed under visible light. The different absorption and scattering of the near infrared radiation by the diverse components of a surface can reveal hidden information or highlight faded details. This is possible due to the penetration capability of the near infrared radiation, in comparison to visible light, through the superficial layers and the recording of images of high contrast.

Spectral imaging systems are capable of acquiring and analyzing high definition images across multiple spectral bands of broad or narrow band width. Depending on the spectral resolution, it may be possible to calculate a full spectrum per image pixel from the acquired spectral cube that contains both spectral and spatial data. These systems are basically composed of a filtering or dispersing device and a camera detector interfaced to a computer.

Another useful application of multispectral imaging is the production of false colour infrared images (FCIR). The camera detects and records the reflectance behaviour of an object in three different wavelengths (green, red and near-infrared). The final image is a coloured combination, which is easy for the observer to detect differences. Infrared colour images allow a sharper

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<sup>3</sup> Kodak 1972, 51; Bearman *et al.* 1996, 61, 62.

<sup>4</sup> Ware *et al.* 2000, 2488.

<sup>5</sup> Easton *et al.* 2011, 1441.

<sup>6</sup> Booras *et al.* 1999, 95.

visualization of the original material due to the fact that IR radiation tends to be less scattered by a thin cloudy layer such as varnishes, consolidants, glues or dirty layers. Infrared false colour has been used as a non-invasive method for approximately determining coloured material *in situ* on painting or manuscripts.<sup>7</sup> The experimental procedure requires the combination of red/green/blue (RGB) colour images and IR reflectograms to create a false colour image where each material is represented by a specific false-colour that depends on its interaction with IR light; the interaction is strictly related to the chemical composition of the material and may also depend on the construction technique of the object, i.e. colour composition, and layers on the surface. The materials may have similar absorbance in visible light but they may differ greatly in their IR absorbance. So similar coloured material may be differentiated and identified by its false colour rendition.

Infrared colour imaging combines the input of green and red wavelengths of the visible with that of one infrared wavelength in order to compose an image which contains, and highlights with colours, information from the infrared region so that it can be perceived immediately by the researcher.

## 2. Description of the Applied Methodology

The documentation procedure was carried out *in situ* at the laboratories of the Museum of Piraeus. Special instrumentation was used which was transported from the Laboratory of Physical Chemical Methods for Diagnosis and Documentation TEI of Athens.

The methodology included the application of the following methods:

I. Traditional colour photography (detail- and macro photographs), in the visible parts of all the papyrus fragments (ΜΠ 8517-8523, Α 27091), all polyptychon tablets (ΜΠ 7452-7455, Α 27045-6-7), the harp (ΜΠ 7458), the aulos (ΜΠ 7447-7448) and four lekythoi (ΜΠ 4721-4724), was carried out to document the condition of each object. A NIKON D70S with a micro NIKKOR lens 60mm f/2.8D and a PENTAX \*ist DL with a PENTAX macro lens 30-55mm f/3.5, tungsten lighting sources and specialized optical barrier filters were used.

II. The next documentation method referred to multispectral imaging, at specific wavelengths of visible and infrared radiation, in normal and raking light, to reveal aspects invisible to the human eye. Two procedures were followed: for

<sup>7</sup> Klein *et al.* 2005, 8; Buoso *et al.* 2009, 153.

the first, specifically chosen wavelengths were examined (420/440nm, 500nm, 600/660nm, 700nm, 800nm, 900nm, 1000nm) in order to record the reflective behaviour of each object: that is, how an object is depicted at an incident radiation of specific wavelength. This procedure was applied to polyptychon tablets MΠ 7452-7455, the papyrus fragments MΠ 8518, MΠ 8520, MΠ 8523 and to lekythoi MΠ 4721-4724. In the second procedure, using the specialized software of the multispectral imaging camera, spectral cubes were acquired. Spectral cubes consist of the recordings of the reflection behaviour of the object in the visible—near infrared area (420-1000nm) with a 20nm step interval. In this case, the differentiation of the reflection degree of different areas on the same object is better understood. This is more obvious in the infrared area in comparison to the visible, a fact that helps enormously in better reading and distinguishing elements of the objects. This procedure was applied to papyrus fragments MΠ 8520 and MΠ 8523 and to lekythos MΠ 4724. The instrumentation used for both procedures included the multispectral camera MuSIS HS by Forthphotonics (now DySIS), fully equipped with optical filters for proper use in the visible and infrared, as well as the appropriate software. Tungsten light sources (2×500 watt) were used for illuminating the objects, which provided adequate intensity both in the visible and the infrared regions.

III. Finally, selected areas of the objects examined by multispectral imaging were captured using infrared colour imaging (false colour infrared imaging). The application of this method was considered essential for the complementary study of the writings on the papyrus fragments, in order to investigate the use of different writing media as well as to differentiate the script from elements pertaining to the condition of the object e.g. scratches, deposits etc. In the case of the lekythos, false colour infrared imaging is the indicated method for the study of coloured areas, the pigment type, and the painting technique. The same instrumentation as for the multispectral analysis was used.

IV. In order to extract the maximum information regarding the script on the papyrus fragments, the polyptychon tablets as well as the lekythos depictions, image-processing techniques were applied on selected images of the visible and the infrared regions. This procedure includes image overall resolution and quality improvement, segmentation and Principal Component Analysis (PCA). The research is still ongoing; nonetheless, some preliminary results are already available. It should be noted that a difficulty of the multispectral imaging that had to be taken into consideration was to avoid prolonged exposure of the sensitive fragments under intense irradiation, which was however essential for obtaining optically balanced images with better quality. Therefore, a portable fan was used to maintain objects' own temperature. The documentation of the

harp and the aulos was carried out at the exhibition room, because due to their fragility it was not possible for them to be either transported to another room for photography or to be dismounted from their specialized cases.

### 3. Preservation State

Before the presentation and discussion of the results, it is important to note some points that refer to the preservation state of the papyrus, since in their light the results will be better understood. This information is based on the official preservation state recordings and conservation treatments found in the archive of the Archaeological Museum of Piraeus and National Archaeological Museum of Athens, by conservator-painter A. Glinos.

In 1981, conservator Antonios Glinos was called onto the site of the excavation of tomb II in Daphne. A roll of ancient papyrus was found in one piece but in very poor condition, which eventually led to its fragmentation. The papyrus comprised several leaves, pasted together as an amorphous mass.<sup>8</sup> A white material resembling plaster had destroyed most of the upper part of the papyrus.<sup>9</sup> The papyrus had deteriorated to a high degree, almost rotten, and it was transported directly to the National Archaeological Museum in Athens, while all other objects from the tomb were sent to the Museum of Piraeus. The first action of the conservator in collaboration with the museum's chemist was to keep the finding in an isolated chamber with high relative humidity so as to approximate the tomb's conditions. As papyrus consist of materials different from those of paper, special handling was necessary. Therefore, Greek chemists, conservators together with Peter Lawson, conservator at the British Library, tried to find an appropriate conservation treatment. The meeting was not fruitful, as Lawson suggested proceeding in the same manner as with dry papyri that is to encapsulate them between two pieces of glass, while the Greek team was concerned that the preservation state of the papyrus, which was extremely moist, meant that this treatment was not correct. Glinos was put in charge of the conservation project. He recorded all procedure steps on grid drawings and took many photographs and slides at all stages. That allowed him to locate the exact areas where other remains were found, as well as their shape and material. Thus, he was able to deduce that the roll of papyrus had

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<sup>8</sup> NatMus BE 29/1981, 19/20 May 1981.

<sup>9</sup> NatMus BE 29/1981, 23 July 1981.



probably been put in a leather pouch inside a small wooden box with leather lining and iron decorations for safekeeping.<sup>10</sup>

Glinos carefully separated legible fragments from the formless mass, trying at the same time to separate them from each other when that was possible. He then constructed special wooden cases with glass top and bottom, in which the two plates were not in contact with each other, leaving a gap of 5mm. This was done on purpose, as the papyrus was rotten and even the slightest touch would have made the material collapse. The bottom glass plate was covered with organic silk fabric, onto which the papyrus fragments were placed, consolidated and restored. Glinos managed to salvage several medium sized (max.3×4cm) papyrus pieces, and a plethora of small fragments bearing one, two or no letters at all. Next, the results for each object or group of objects were thoroughly and separately presented.

#### 4. Experimental Results—Discussion

The number of images recorded is large and they cover different areas of the spectrum, which, in combination with the particularity of each individual or set of objects, require different approaches. The results presented in this chapter are preliminary, as the research is still ongoing.

##### *Harp*

Macro photographs in visible light revealed the presence of striation marks at even spaces (IIa). Further examination of this area by ultra violet fluorescence and reflectance photography as well as Multispectral Imaging and False Colour recording is considered essential in order to gather more information concerning any eventual remaining traces of materials related to the construction technique of the object. Careful examination of the area where the two pieces of wood are connected revealed the existence of several small sized nails. This is helpful in understanding the construction procedure employed for musical instruments. These nails have produced green oxidation products, which are consistent with the use of copper nails (IIb). At the horizontal, bottom part of the harp, a series of small holes can be observed with distinct spacing. The wood grain can be more easily distinguished here than on the other two sides, giving the impression of a more prominent relief (IIc).

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<sup>10</sup> NatMus BE 29/1981, 3 March 1982.

### *Aulos*

A macro photograph enabled a closer view at the holes and hollow wooden body of the instrument (II2a). The surface is even and smooth and the wood is free of micro craquelure. The wood carving at the edge (II2b) is characteristic of the attachment mode of the mouthpiece (II2c). The harp and the aulos objects are thoroughly presented in separate articles in this journal.

### *Papyrus*

In order to achieve the best results of images, e.g. resolution etc., small areas of the object had to be examined each time. This led to a vast number of images, as the papyrus consisted of small fragments, each of which had to be studied separately. The multispectral imaging was carried out in the entire MΠ 8518 and MΠ 8523 cases, while MΠ 8520 in selected fragments (II3a, II3b). The selection was based on the information that each fragment could provide.

MΠ 8518 is a composition size 9×4cm which consists of smaller pieces (II3b). The papyrus sheets cannot be distinguished from each other, as they form an amorphous mass. In the visible parts some scattered letters are difficult to see. In the non-visible parts infrared enables the detection of more letters on the surface layer, at various places and orientations (II4a). However, in this case, due to the thickness of the amorphous mass, infrared cannot penetrate to deeper layers. False colour imaging proved to yield better results in distinguishing the letters compared to single wavelength recording (II4b). The ink could easily be mistaken as a scratch or impurity in the black and white image at 1000nm, but was readily recognizable on the reddish false colour of the papyrus, as it remained black.

Concerning MΠ 8520, in the visible, the reflectivity of the ink is similar to that of the writing surface, so the image contrast is low (II3a). The fragments are treated with a material, possibly the consolidant Glinos referred to in his reports, in the writing area. This makes them look more opaque and dark because of ageing. As the wavelength increases, the penetration capability of the infrared through the consolidant layer of the papyrus increases too, since organic material is transparent to near infrared radiation and the papyrus begins to reflect more than the ink and so the text contrast increases (II5a, II5b). Furthermore, the penetration capability of the infrared enables better visualization of lower layers of papyrus, revealing hidden text from underneath (II6a, II7a, II7b). An interesting observation is that areas without letters produce a pure orange-reddish false colour in contrast to areas containing letters that are darker (II6b). Chemical analysis is needed to fully understand and

explain this phenomenon. Plant fibres can also be distinguished clearly using false colour imaging, a fact that is connected to the good preservation state of the fragment.

In the separate piece of MII 8523 (II8a), letters from several layers are revealed by means of different grey levels of the letters. As the grey level of the ink is related to the depth the infrared radiation reaches, the deeper the radiation goes the weaker the signal from the ink and the lighter the letters appear (II8b).

A significant observation concerning MII 8520 and MII 8523 refers to the independent study of their spectral cubes. The interval step of 20nm showed that no substantial differentiation of the text readability could be observed in the visible wavelengths. On the other hand, in the infrared area, after 760nm and especially at 1000nm, the maximum contrast between the papyrus and the script is reached. Further examination of the papyrus fragments at higher wavelengths using infrared reflectography, given the fact it can reach up to 2250nm, could yield more promising results due to higher penetration capability of this method.

In all cases of papyrus fragments the letters were written with black ink the behaviour of which in the infrared is typical of carbon-based ink.<sup>11</sup>

### *Writing Tablets*

The first wooden tablet, marked as MII 7452, approximately 13.5×5.8×0.4cm, has one flat side and one side, marked as A2 (II9a), slightly engraved in order to be filled with a thin layer of wax, remains of which are visible. The recording of the reflectance of the surfaces in deep blue (420nm) as well as in near infrared (1000nm) indicates the use of a very good quality wood, as it is very smooth, homogenous and without prominent grain. Areas of greenish colour can be observed on both sides. The patches of yellowish wax with traces of text that can be found on side A2, produce a light grey level in the infrared spectral range rendering it very easy to distinguish. In contrast, contemporary wax substances used by conservators to fill in gaps appear as black spots (II9b).

Tablets with inventory numbers MII 7453 (sides B1, B2), MII 7454 (sides Γ1, Γ2) and MII 7455 (sides Δ1, Δ2) have a similar size of approximately 10×5×0.3cm. They are all engraved on both sides and bear wax that in many cases covers the entire surface. The wax in the visible is more reddish than tablet MII 7452 side A2, but in the infrared presents the same reflectivity as the yellowish one.

<sup>11</sup> Alexopoulou *et al.* 2002, 7; Attas *et al.* 2003, 131.

Traces of text can be seen on sides A2, B1, B2 and Γ2. The legibility of the letters is assisted by infrared imaging due to the better contrast, and they can be fully highlighted using macro normal and raking light as they are engraved and thus their optical behaviour differentiates from the surrounding wax (II10a, II10b, II10c, II11a, II11b). Letter size is approximately of 1.5mm height. Apart from scattered letters, lines of text are observed (II12a, II12b).

### *Lekythoi*

The four lekythoi were documented in the visible (II13a, II13b, II13c, II13d).

As the surface of the lekythoi is at a poor state, useful information cannot be easily distinguished. The acquisition of images using specific wavelengths of the visible (420/440nm and 660nm) enables the recording of the drawing details with higher contrast and sharpness (II14a, II14b, II14c). Furthermore, the lack of colour in the black and white images and the short wavelength (420/440nm) facilitates the observation of the superficial details (II15a, II15b), while the near infrared radiation reveals important drawing details (II16a, II16b).

Multispectral imaging recorded the preservation state of the lekythos MII 4724. Unfortunately there is not enough space to present all images acquired from the spectral cube, which demonstrate the condition of the surface gradually from outer to inner layers. The more representative image of the superficial layer corresponds to 420nm wavelength (II17a), where areas with loss of colour on the preparation layer, which in some cases reaches to the main body, are easily distinguished. On the other hand, the penetrating capability of the infrared reveals clearly the initial drawing of the figures and the decorative designs as if no colour had been added, as well as a clearer view of the condition of the preparation (II17b). It is worth noting that the traces of the standing figure are highlighted using infrared (II18a), so more details of the drawing can be observed at 1000nm, as already mentioned.

An estimation of the pigments used can be done according to the false colours the paint layers present in the infrared region. Carbon based black seems to have been used for drawing as it remains black in the false colour recording (II17c, II18b). Another kind of black seems to have been used for the floral decoration, as it appears more opaque and dense. Two different red pigments are also observed: a vivid red, which was employed to depict the textiles of the figures, the banner and floral decoration, and a brownish red which is found only in geometrical decoration (II18c). The first produces a yellow false colour, which is typical of pure cinnabar and minium red pigments (II17c, II18b, II18d). Taking into consideration that the use of cinnabar has been reported

in decoration of lekythoi of this period<sup>12</sup> and the fact that the hue of the vivid red colour of the decoration in the visible resembles that of cinnabar more than that of minium, it may be hypothesised that cinnabar was used in the case of lekythos MII 4724. Furthermore, the yellow false colour of the pigment can indicate the areas of application even when the colour itself has faded in the visible. On the other side, the brownish-red colour produces a brown false colour, which is typical of iron oxide pigments (red ochre, haematite). Chemical or Electron Microscope SEM-EDAX analysis of the pigments is needed to confirm the results.

## 5. Conclusion

The application of multispectral and false colour imaging on a selection of the findings of tombs I and II yielded several results. Even though the examined objects were different and diverse regarding the material used, their construction technique and state of preservation, all of them provided additional information. The applied methodology, due to its non-invasive character, was proven to be the most appropriate approach for examining these artefacts whose significance and fragility does not easily allow sampling.

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<sup>12</sup> Cohen *et al.* 2006, 14; Burnett 2001, 71.

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Plate II 1a. Harp. Striation marks. Visible, macro (MΠ 7458).



Plate II 1b. Harp. Upper corner. Visible, macro (MΠ 7458).





Plate II 1c. Harp. Horizontal part where holes are observed. Visible, macro (MII 7458).



Plate II 2a. Aulos. Hollow wooden body. Visible, macro (MII 7447-8).





Plate II 2b. Aulos. Wood carving. Visible, macro (MII 7447-8).



Plate II 2c. Aulos. Mouthpiece. Visible, macro (MII 7447-8)



Plate II 3a. Papyrus, total. Visible (ΜΠ 8520).



Plate II 3b. Papyrus, total. Visible (ΜΠ 8518).





Plate II 4a. Papyrus, bottom right corner. Infrared, 1000nm (MΠ 8518).



Plate II 4b. Papyrus, bottom, right corner. False colour, infrared (MΠ 8518).

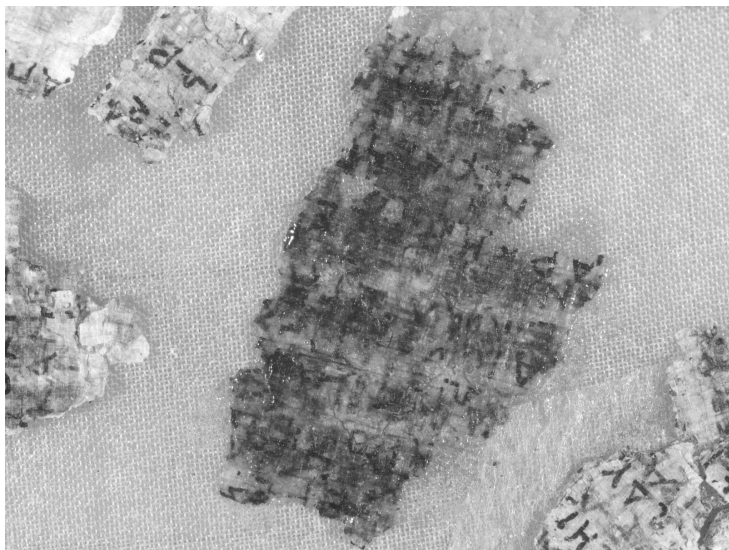


Plate II 5a. Papyrus, center, left fragment. Infrared, 1000nm (MPI 8520).



Plate II 5b. Papyrus, right edge, vertical fragment. Infrared, 1000nm (MPI 8520).

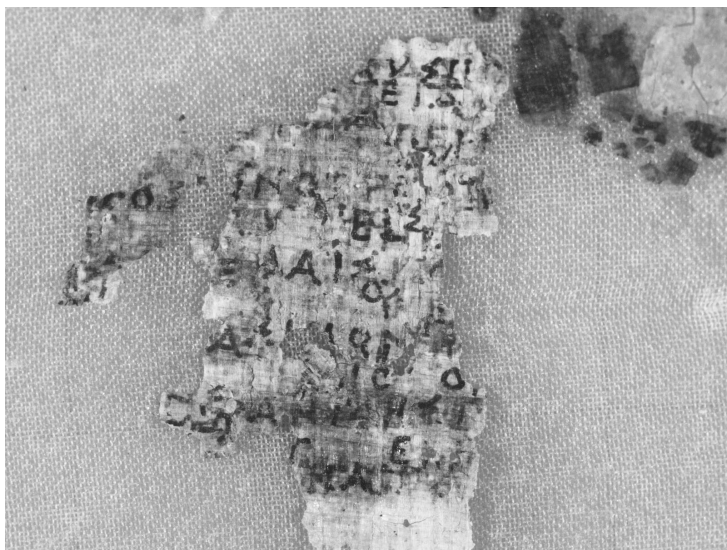


Plate II 6a. Papyrus, bottom, left fragment. Infrared, 1000nm (MΠ 8520).



Plate II 6b. Papyrus, bottom, left fragment. False colour, infrared (MΠ 8520).



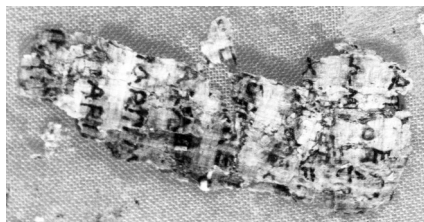


Plate II 7a. Papyrus, top, left edge, fragment. Infrared, 1000nm (MII 8520).  
after image processing



Plate II 7b. Papyrus, center, left edge, fragment. Infrared, 1000nm (MII 8520).  
after image processing



Plate II 8a. Papyrus. Visible (MPI 8523).



Plate II 8b. Papyrus. Infrared, 1000nm, (MPI 8523).





Plate II 9a. Tablet, side A2. Visible (MΠ 7452).



Plate II 9b. Tablet, side A2. Infrared, 1000nm (MΠ 7452).



Plate II 10a. Tablet, side B2, Infrared, 1000nm (ΜΠ 7453).

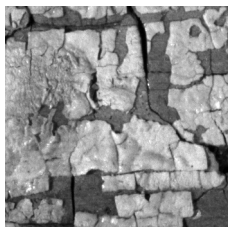


Plate II 10b. Tablet, side B2, detail. Infrared, 1000nm (ΜΠ 7453).

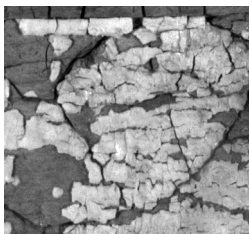


Plate II 10c. Tablet, side B2, detail. Infrared, 1000nm (ΜΠ 7453).

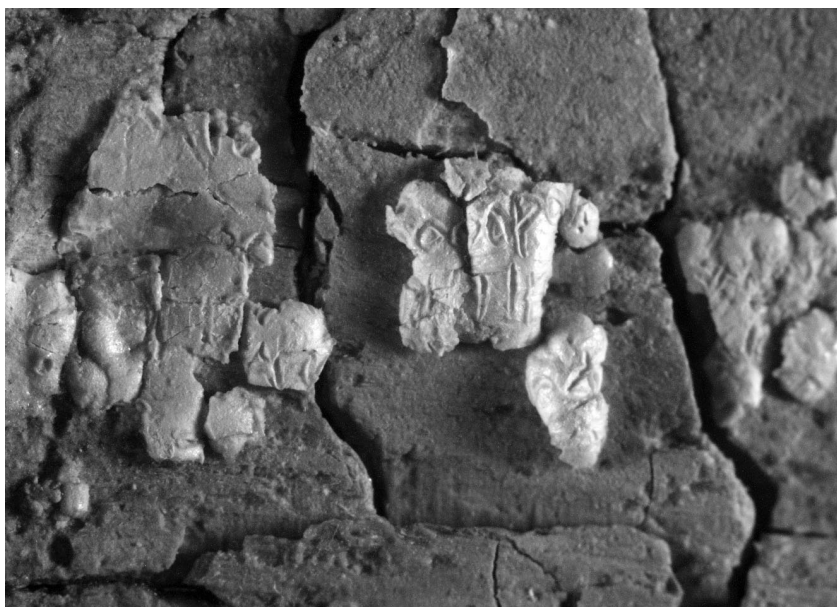


Plate II 11a. Tablet, side A2, macro, infrared, 1000nm (ΜΠ 7452).

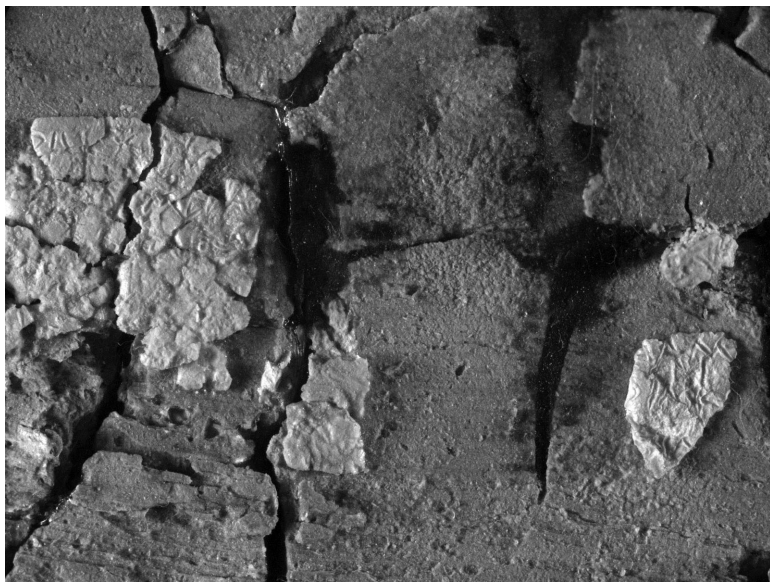


Plate II 11b. Tablet, side A2, macro, infrared, 1000nm (MPI 7452).



Plate II 12a. Tablet, side A2, macro, raking infrared, 1000nm (MPI 7452).





Plate II 12b. Tablet, side B1, macro, raking infrared, 1000nm (MII 7453).



Plate II 13a. Lekythos—ΜΠ 4721—visible.



Plate II 13b. Lekythos—MII 4722—visible.





Plate II 13c. Lekythos—MΠ 4723—visible.



Plate II 13d. Lekythos—MII 4724—visible.



Plate II 14a. Lekythos—MII 4723—left side, visible (440nm).



Plate II 14b. Lekythos—MII 4723—front, visible (440nm).



Plate II 14c. Lekythos—ΜΠ 4723—right side, visible (440nm).



Plate II 15a. Lekythos—ΜΠ 4721—right side, visible (440nm).





Plate II 15b. Lekythos—MP 4723—left side, visible (660nm).



Plate II 16a. Lekythos—MP 4722—left to front side, infrared (1000nm).





Plate II 16b. Lekythos—MΠ 4724—front, infrared (1000nm).



Plate II 17a. Lekythos—MΠ 4724—right side, visible (420nm).



Plate II 17b. Lekythos—MII 4724—right side, infrared (1000nm).



Plate II 17c. Lekythos—MII 4724—right side, false colour infrared.



Plate II 18a. Lekyθος—MP 4724—left side, infrared (1000nm).



Plate II 18b. Lekyθος—MP 4724—left side, false colour infrared.



Plate II 18c. Lekythos—MPI 4724—floral decoration, visible.



Plate II 18d. Lekythos—MPI 4724—floral decoration, false colour infrared.

## The White Lekythoi and the Dating of Tomb 1

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### Abstract

The central purpose of this paper is to establish the date of the burial of tomb 1.

The four white lekythoi, which were found in it, will be discussed concerning shape, use of colours, ornament, style and subject. The conclusion will be that these lekythoi are dated between 430 and 425 B.C.

Scopo principale di questo lavoro è stabilire la data di sepoltura della Tomba I. Le quattro *lekythoi a fondo bianco* che vi sono state rinvenute vengono discusse per quel che riguarda forma, uso dei colori, ornamenti, stile e soggetto. La conclusione è che queste *lekythoi* siano databili tra 430 e 425 a.C.

### Keywords

White lekythoi, shape, technique and style of painting, date

The four white lekythoi painted with matt colours from tomb 1 (inv. 4721-4724) are of the so-called standard shape. They show (though different in height) its typical design and decoration: a disc foot with a groove running around the outside near the top, a cylindrical body with a shoulder sharply set off, a long narrow neck with calyx mouth, a handle on the back between shoulder and join of neck and mouth (pl. II 13a-d; pl. III 1a-d, 2a-d).

Black glaze appears on top of the disc foot and continues until the picture field. Neck and handle are also glazed, as well as the outside of the calyx mouth. Its top, the outside of the disc foot and its underside are unglazed and have traces of miltos. The greatest part of the lekythoi, the picture field with shoulder, is covered by cream-white (in some places yellow-brownish discoloured). On it a figure scene and ornaments are painted in matt colours. Figures, most objects and ornaments are drawn grey-black. Tainiai, parts of garment and



particular petals of the shoulder palmettes are red. For this colour, according to the research of Athina A. Alexopoulou,<sup>1</sup> cinnabar was used.

The four lekythoi show above the picture field—below the join of body and shoulder—a pattern band with meander (broken) running<sup>2</sup> left (inv. 4721 and 4724) or right (inv. 4722 and 4723). The meander is accompanied by matt red-brown lines running round. Another line of this colour appears between the figure scene and the black-glazed lower part, together with an unglazed band. The shoulder ornament, consisting of palmettes, is well preserved on two lekythoi (inv. 4723 and 4724; pl. II 14a, pl. II 18c). Here a hanging central palmette is flanked by two lying palmettes on the side, all three connected by volute tendrils and adorned by small spandrel buds. This is the normal shoulder ornament on white lekythoi of the standard shape in the second half of the fifth century B.C.<sup>3</sup> The palmette petals are alternatively grey-black and red. On the shoulder of lekythos inv. 4722 only the hanging palmette in the centre is recognizable. On the lekythos inv. 4721 the left palmette strangely is upright, whereas the right one is lying, the central lost. As far as the hearts of the palmettes are preserved, they look nearly oval, with a red nucleus. Between shoulder and neck there is no egg pattern, as it is known from many lekythoi, but a simple grey line. The similarities in painting and use of colours, the correspondence in a large degree of shape<sup>4</sup> and ornament point to a production of the four lekythoi in the same workshop.

Three lekythoi are unbroken, the fourth (inv. 4722) is restored from fragments. The surface, especially the painting on all four, is badly damaged. The matt colours, which were added after firing, are not well preserved. Much of them is totally lost, due to factors that have not been established; the damage is certainly not an effect of cremation, of which there are no indications. After excavation the lekythoi were restored by mending spots on the surface, on lips and feet. Ornament and figures were left in their fragmentary condition.

As far as the images are recognizable, the lekythoi show in two-figure-scenes the so-called ‘visit to the tomb’. That is: a grave stele is framed by two human figures. On two of the four lekythoi (inv. 4721–4722) the stele has disappeared, and the lateral figures are damaged. The lekythos inv. 4723 shows a shaft stele on a two-step base, with an egg band under a profiled top (pl. II 14b). Red

<sup>1</sup> See the paper of Athina A. Alexopoulou above.

<sup>2</sup> Kurtz 1975, fig. 4g.

<sup>3</sup> As far as recognizable it is type II A; see Kurtz 1975, fig. 6.

<sup>4</sup> The height alternates between 26,5 cm (inv. 4724) and 34 cm (inv. 4722). Only the biggest of the four lekythoi has a clearcut fillet flanked by incised lines. The other three lekythoi have only an incised line between body and foot.

tainiai with long black and red cords at the ends adorn the monument. Stelai of this shape are found on lekythoi from the middle of the fifth century B.C. to the beginning of the last quarter.<sup>5</sup> The date of the monument on the lekythos inv. 4724—which is a column, as is shown by the flutes—is later (pl. II 16b). The column is topped by acanthus leaves, which appear also in the middle and at the bottom. Their contours are drawn in red. We know acanthus leaves from tomb pictures of the last quarter of the fifth century B.C.,<sup>6</sup> occasionally also of the third quarter. On the other hand, tomb monuments in the shape of a column with acanthus are rarely represented, and not earlier than 430 B.C.

On lekythos inv. 4723 a woman in three quarter view is standing on the right, her head in profile. She wears a peplos with red folds, her hair is tied up. From the flat basket in her hands red tainiai with long black and red cords are hanging (pl. II 14c).<sup>7</sup> Opposite, on the left side, a youth is standing in profile. He leans on a staff, lightly bending forward, and stretches his right hand. Nothing remained of his himation (pl. II 15b). On the right side of the acanthus monument (inv. 4724) a woman with short hair kneels in profile. She raises her right hand in a gesture of mourning, her left arm is stretched forward (pl. II 17c). Her garment, with red folds, is similar to that on inv. 4723. A red tainia hangs above her. The fragmentary red garment on the left belongs, according to infrared photos, to a female figure (pl. II 18b). Not much has remained of the picture on inv. 4721 (pl. II 15a). A flat basket with wreaths appears, adorned by a zig-zag band. There are red tainiai with long black and red cords. Some grey lines may belong to a garment, and the red subject is perhaps a boot. The picture on inv. 4722 shows something more: on the left side a female figure in three quarter view, the head in profile. She holds in her left hand a basket with red tainia and long black and red cords. It is adorned with a merlon pattern. On her right hand there is a red tainia and an upright alabastron. Her head is slightly lowered, her hair bound up in a loose shock (pl. II 16a). A tainia, not well preserved, is hanging behind her head. On the right side there are remains of a figure looking left, clad in a red mantle, with naked feet.

The pictures on the Daphni lekythoi, after all, are conventional. The most frequent motif on lekythoi of the second half of the fifth century B.C. was the ‘visit to the tomb’. It appears in all Athenian workshops where white lekythoi

<sup>5</sup> Nakayama 1982, Stelentyp A IV, 60–5.

<sup>6</sup> Nakayama 1982, Stelentyp E V/VI, 119–31; Kunze-Götte 1984, 185–97.

<sup>7</sup> For this type of tainia see Krug 1968, 3–9 (type 1); Oakley 2004, 204.

were produced. The same may be said about the represented objects: baskets, wreaths, alabastra and tainia.<sup>8</sup>

Two different possibilities exist for the ‘visit to the tomb’. In some cases the pictures show either only relatives of the dead person, mourning, bringing gifts, adorning the stele; in others a deceased person is represented opposite their relative.<sup>9</sup> In our case the state of preservation does not allow a decision between these two possibilities. The woman with the basket on inv. 4723, and the similar woman on inv. 4722 may be called visitors. But it remains uncertain whether the youth on inv. 4723 is the deceased or a related person. On inv. 4724 the woman on the right is defined by her gesture. The interpretation of the woman on the left side is open.

Various different facts are decisive for the chronology of the Daphni lekythoi. First of all, the exclusive use of matt colours puts them into the second half of the fifth century B.C. The shape of the tomb monument on inv. 4723 belongs to the years around 430 B.C., whereas in the other case, on inv. 4724, the date of the acanthus column is certainly after 430 B.C. We have seen that the four lekythoi belong to the same workshop. As they were specially made for funeral rites, they cannot have been used for years at home. They were acquired all together for a funeral. Thus their chronology should be between 430 and 425 B.C. This is corroborated by two technical observations: The pictures of the lekythoi do not show the mixture of matt colours and glaze contours, which often appears between 450 and 430 B.C. And we do not meet on them a drawing with strong dark red contours, which is typical for the Reed Painter, the Triglyph Painter and Group R in the years ca. 420–410 B.C.<sup>10</sup> As to the system of decoration, it is noticeable that the obligatory egg band between shoulder and neck is substituted by a grey line, a simplification known from the last third of the fifth century B.C. The design was simplified too, as the clear-cut fillet between body and foot—with incised lines above and below—exists only on the biggest of the four lekythoi (inv. 4722). This also points to a date later than the Parthenon.

The fragmentary condition of the figure drawing is not favourable for assigning these lekythoi to painters or to a certain workshop. The motifs, as far as they are recognizable, give only restricted information. The striking motif of the kneeling woman with her gesture of mourning does not help us to assign

<sup>8</sup> See Oakley 2004, 203–6.

<sup>9</sup> See Oakley 2004, 145–214. See also Kunze-Götte 2009, 53–64.

<sup>10</sup> For the colour palette of these painters see Kurtz 1975, 59; Wehgartner 1983, 28–9.

it to a painter (pl. II 17c). It is similar on lekythoi by the Sabouroff Painter,<sup>11</sup> the Phiale Painter,<sup>12</sup> and by painters of the Bird Group<sup>13</sup> until the Woman Painter,<sup>14</sup> that is between 440 and 420 B.C.<sup>15</sup> Garments in outline, the interior painted with fine, dense red folds, are known from the Sabouroff Painter,<sup>16</sup> the Painter of the New York Hypnos (related to the Sabouroff Painter),<sup>17</sup> from figures in the circle of the Bird Group as well as from the Woman Painter.<sup>18</sup> The type of the stele on inv. 4723 is well known from the Thanatos Painter, but it exists occasionally also on lekythoi by the Sabouroff Painter, the Achilles Painter and his circle, and later by the Painter of Munich 2335 und the Bird Painter and his group.<sup>19</sup> The acanthus column on inv. 4724 points to the circle of the Woman Painter,<sup>20</sup> where acanthus leaves with red contours occur too.<sup>21</sup> Short hair as a sign of mourning, as it is worn by the woman on inv. 4724 (pl. II 17c), is a frequent motif on lekythoi by the Thanatos Painter, and occurs also later, for example in the work of the Woman Painter.<sup>22</sup> But this artist's figures—see the lekythos in Athens (Nat. Mus. inv. 1955)<sup>23</sup>—differ in flexibility, grace and elegiac mood from the woman on inv. 4724. Nearer in style and expression to the Woman Painter is the female figure in three quarter view with basket and alabastron on inv. 4722 (pl. II 16a) and the youth on inv. 4723 (pl. II 15b).<sup>24</sup> On the other hand, as far as we can tell, no woman on the Daphni lekythoi wears an ependytes, which is often represented by the Woman Painter.<sup>25</sup> Sometimes he also shows the 'torch'-hairstyle,<sup>26</sup> which was much beloved later, towards the end of the fifth century B.C. The Daphni lekythoi do not show it.

<sup>11</sup> Oakley 2004, fig. 116.

<sup>12</sup> Oakley 2004, fig. 123.

<sup>13</sup> Kurtz 1975, pl. 41.2.

<sup>14</sup> Oakley 2004, fig. 128.

<sup>15</sup> Athusaki 1970, 52–3; Felten 1971, 98.

<sup>16</sup> Felten, 1971, 97, pl. 13.1–2.

<sup>17</sup> Oakley 2004, fig. 47; Tzachou-Alexandri 1989, pl. 18–19.24.

<sup>18</sup> Stampolidis and Parlama 2000, n. 234; CVA Berlin, Antikenmuseum 8 (Deutschland 62) pl. 27–8.

<sup>19</sup> Nakayama 1982, 203–11.

<sup>20</sup> Kunze-Götte 1984, 185–97.

<sup>21</sup> CVA Berlin, Antikenmuseum 8 (Deutschland 62) pl. 26,7. 27,7. 28,4–5.

<sup>22</sup> Thanatos Painter: Riezler 1914, pl. 28, 30, 32, 54, 55; Felten 1971, pl. 2.2, 7.3, 8.1. 27. 4, 27.6.

<sup>23</sup> Athens NM 1955, Beazley, ARV<sup>2</sup> 1372.4 = Riezler, pl. 71; Oakley 2004, fig. 127–9. For the Woman Painter generally see: Kurtz 1975, 57; Oakley 2004, 17–18.

<sup>24</sup> For the youth compare München 6027, CVA München 15 (Deutschland 87) pl. 63, 1.

<sup>25</sup> For the ependytes see E. Kunze-Götte in CVA München 15, 108.

<sup>26</sup> See Athens NM 1955, above n.23.

The representations on the four lekythoi are clearly connected with traditions coming from the workshop of the Achilles Painter and the Phiale Painter in the time of the Parthenon.<sup>27</sup> The oval palmette hearts in the shoulder ornament of the Daphni lekythoi (pl. II 18c) belong into the same context. They developed from palmette hearts in the shape of drops which were painted in that workshop.<sup>28</sup> The Sabouroff Painter and the Thanatos Painter worked in it for some time.<sup>29</sup> Research has shown that the Painter of Munich 2335 and the Bird Painter are connected with the later work by the Thanatos Painter and are thought to have worked in the Achilles Painter's long tradition.<sup>30</sup> These observations give us a better understanding of the correspondence of motifs between the Daphni lekythoi and the pictures of many different painters. We do not meet the simplifications in shape and ornament, which were noticed above, until after 430 B.C. The opulent acanthus column on inv. 4724, the light hairstyle of the youth on inv. 4723 and of the woman in three quarter view on inv. 4722, together with her motion and mood, make it clear that the Daphni lekythoi do not belong to the time of the late Achilles-, Phiale- and Thanatos Painters. Their origin was in the transition to the 'Rich Style', though their clear contours and the reserve in expression and gesture are inherited from the painters of the Parthenon time. The four lekythoi from the Daphni tomb, after all, were painted by successors of the younger generation of the Achilles- and Phiale Painter's workshop. Its tradition is still there, while at the same time we can detect the new influence from the first phase of the Woman Painter.

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<sup>27</sup> For the Phiale Painter as pupil of the Achilles Painter see Oakley 1990.

<sup>28</sup> Compare Oakley 1990, pl. 109-11, 113, 145; Oakley 1997, 182.

<sup>29</sup> See Oakley 1997, 105-6, 106-7; Oakley 2004, 16-17.

<sup>30</sup> See Kurtz 1975, 52-6; Oakley 1997, 106-108; Oakley 2004, 17.



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Plate III 1a-b. Lekythos MII 4721. Photos: E. Pöhlmann.



Plate III 1c-d. Lekythos MΠ 4722. Photos: E. Pöhlmann.



Plate III 2a-b. Lekythos MII 4723. Photos: E. Pöhlmann.





Plate III 2c-d. Lekythos ΜΠ 4724. Photos: E. Pöhlmann.



## The Writing Tablets and Papyrus from Tomb II in Daphni<sup>1</sup>

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### Abstract

The author describes the fragmentary writing tablets and papyrus remnants discovered in one of the Daphni tombs in 1981, dating from 430/420 BCE. He offers transcriptions of the legible portions and assesses their possible literary significance.

L'autore descrive i frammenti di tavolette per la scrittura e i resti di papiro rinvenuti nel 1981 in una delle tombe di Daphni, risalenti al 430/420 a.C. Egli presenta le trascrizioni delle parti leggibili e accerta il loro possibile significato letterario.

### Keywords

earliest Greek papyrus, writing tablets, Daphni tombs

It is exciting to have found a Greek tomb containing remains of three different musical instruments, together with writing implements and various other articles. It is even more exciting to find in the same tomb written texts of an apparently literary character. In this paper I give an account of these fragmentary documents and of what it has so far been possible to see on them. It amounts to very little, no more than a word here and there: no sensational revelations, nothing like the Derveni papyrus from northern Greece, which yielded many columns of readable text. But the Daphni texts are still of exceptional importance as comprising the oldest Greek papyrus now known (something like a century older than the Derveni papyrus) and the oldest Greek writing tablets. The tomb is dated to 430/420 BCE, and the written materials will not be much older.

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<sup>1</sup> See the first footnote to Egert Pöhlmann's paper earlier in this volume.

Almost all surviving Greek papyri and wooden writing tablets come from Egypt, because the very dry climate of that country allowed them to survive, while in Greece, Italy, and other lands where Greek books were current in antiquity they perished. That is why, until fifty years ago, we had no Greek papyri from before the time of Alexander, when the Greeks conquered Egypt. Then in 1962 came the news that a papyrus roll had been discovered in northern Greece, near the Derveni pass, some kilometres north-west of Thessaloniki. It lay on the edge of a funeral pyre and had been carbonized by the heat: that is what had saved it from the decomposition that would have been its normal fate. The Daphni papyrus and tablets, on the other hand, were preserved through being in an enclosed marble sarcophagus in conditions of very high humidity.

### The Writing Tablets

Five wooden writing tablets have been preserved or restored (ΜΠ 7452-5 and Α 27047; further fragments are inventoried as Α 27045-6). ΜΠ 7452-5 have been numbered on front and back with white ink as Α 1/2, Β 1/2, Γ 1/2, Δ 1/2. They are rectangular, and quite small. Tablets Β, Γ, and Δ are of matching size, approximately 10 × 5 × 0.3 cm, and no doubt formed a set; they had holes bored on one of the long sides, perhaps two groups of two holes, so that they could be fastened together with a thong or rings to form a *polyptychon*. Tablet Α is larger, approximately 13.5 × 5.8 × 0.4 cm, and has no holes, so it appears to have been a separate single *deltos*. The restored fragment Α 27047, measuring approximately 11.5 × 6.6 cm, again has no holes. Tablets Α-Δ are shown on plates II 9-10, IV 1-3, and the other fragments on plate IV 4.

On one side of Α and Α 27047, and on both sides of Β Γ Δ, the central part of the surface is chiselled out to leave a writing area surrounded by a raised frame; this protected the writing surfaces from rubbing against each other when tablets were bound together. The writing areas were covered with wax, patches of which remain. The wax on tablet Α is yellowish-brown, that on Β Γ Δ much redder. Remains of the same reddish wax appear also on the fragments Α 27045/46. The difference is further proof that tablet Α does not belong to the same set as the others. No wax remains on the writing area of Α 27047. The fact that this fragment was designed for writing only on one side indicates that it was one of the outer tablets of a *polyptychon*, perhaps belonging to tablet Α.

Some remains of writing can be seen on tablets Α 2 (plates II 9ab, 11ab, 12a), Β 1 and 2 (plates II 10a-c, 12b), Γ 1 and 2, and Δ 1 and 2. It runs parallel to the long

sides of the frame, along the grain of the wood. On B 1, Γ 2, and Δ 1 the lines run downwards from the hinged side of the tablet, while on B 2, Γ 1, and Δ 2 they run towards it. (On A there was no hinge.) The explanation for the divergence is that the user held the *polyptychon* with the hinged side at the top and wrote on the recto tablet downwards; then one lifted the tablet up, wrote on the verso downwards back towards the hinge, continuing down onto the second tablet. In the case of tablet Γ the side numbered 2 was evidently the recto, and 1 the verso.

Writing tablets of this sort had been used for centuries in Greece and the Near East, and they continued to be used throughout antiquity. The design did not change. A well-preserved early example was recovered from the Ulu Burun shipwreck, dating from around 1300 BCE. The ship appears to have been sailing from Syria by way of Cyprus and was heading for the Aegean when it sank off the coast of Lycia with its large cargo of metal ingots, tools and weapons, gold and silver jewellery, ivory, glass, pottery, spices, and various other goods.<sup>2</sup> It is a diptych, just two tablets hinged together at the long side. It has the same rectangular shape as with the Daphni tablets, and the hollowed-out writing areas, which the raised edge protected from rubbing against each other when the diptych was closed.

The Greeks took over this simple invention in the eighth or seventh century from the Phoenicians. Their usual word for such a tablet, δέλτος, or in the Cypriot dialect δάλτος, is borrowed from the West Semitic *dalt* or *delt*; it is feminine because the Semitic word was feminine. This was the ‘folding tablet’, the πῖνᾱξ πτυκτός, that is mentioned in the *Iliad* (6. 169) in the story of Bellerophon’s adventures in Asia Minor. Proitos sent Bellerophon to Lycia with a letter written on the tablet.

As for fifth-century Athens, we may recall the famous cup painted by Douris around 490 or 480 and showing school scenes (Berlin 2285). In one of the two scenes (plate IV 5) the teacher is depicted sitting in the centre with his stylus poised over what may look like a laptop computer but is in fact an open book consisting of three tablets bound together, a *triptychon*. The tablets from the Daphni tomb correspond very nicely with this picture, in that the writing, as we normally find it in later tablets, ran parallel to the long sides of the frame, with the hinged side at the top of the unopened book; the user lifted each tablet away from him to expose the next one.

<sup>2</sup> On the Ulu Burun wreck see Bass, Pulak, Collon and Weinstein 1990. An excellent image of the tablet may be found on the website of the Institute of Nautical Archaeology at Texas A&M University, <http://nautarch.tamu.edu/class/316/uluburun/diptych.jpg>.

Waxed tablets were easily erasable and re-usable, and they were used for writings not intended to be kept for the long term, for example for letters (as in the Bellerophon story) and for school exercises (as on the Douris cup). We have school tablets from the Hellenistic period on which a boy has copied out his assignment in a large, clumsy hand. But this is not what we have in the case of the tablets from the Daphni tomb: here the writing is neat, well-formed, and microscopically small. It is clearly the work of a practised hand, and the amount of text written must have been considerable. Tablet A appears to have had about eighteen lines of writing fitted into its vertical space of 5.3 cm, with perhaps 90 characters to the line. Tablet B had about fourteen lines on side A, seventeen on side B, with about 70-80 characters to the line.

The script used is the Ionic alphabet, with  $\eta$  and  $\omega$  for long [e:] and [o:]. Although this alphabet was not officially adopted at Athens until 403/2 BCE, it was in frequent use in public and epigraphic texts in Attica in the second half of the fifth century.<sup>3</sup> So it is no great surprise to find it being used in written documents dating from around 430. The letter-forms (see figure 1) are similar to those of contemporary inscriptions, with square epsilon and four-barred sigma.<sup>4</sup>

The traces of visible text are disappointingly meagre, and it is hardly ever possible to make out a whole word, let alone two together. The provisional readings offered in *ZPE* 180 (2012), 4-5, are now superseded thanks to an excellent new set of photographs taken by Athena Alexopoulou in July 2012; my best thanks to her for sending them to me. Here is what I now persuade myself that I can see. The line numbers, for fragments not at the upper edge of the writing area, are estimates and I cannot guarantee their accuracy.

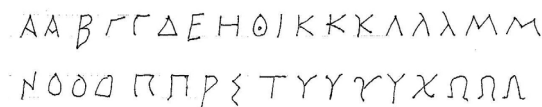


Figure 1. Letter-forms on the tablets.

<sup>3</sup> See Threatte 1980, 26-49.

<sup>4</sup> I withdraw the statement in Poehlmann and West 2012, 4 with n. 23, that an abbreviated, two-bar sigma is also found. From the new photographs I can see that the letter in question was a normal four-bar sigma.

A 2, left and centre (see plate II 11ab)

4	[	c.26 letters	]	φ	ι	λ	υ	λ	[				
5	[	..]	μ	η	λ	[	]	μ	β	ι	α	[	
6	[	....]	[	..(.)	]	ρ	ο	θ	ο	ρ	ο	[	
7	[	....]	α	[	..]	η	τ	ι	κ	[	..]	υ	...]
8	[	....]	α	π	ο	[	]	υ	θ	[	]	ι	[
9	[	]	.	[	]	δ	α	[	]	λ	α	μ	[
10	[	]	.	[	]	ο	ι	μ	ο	[	]	ι	λ

In line 4 perhaps φιλου. In line 6 we see perhaps π]ροθορο[υα or some similar form; or it might be e.g. γά]ρ ό θορό[ c. As there is a vertical crack through the θ, I cannot exclude a φ, which would open up other possibilities.

A 2, upper right corner (see plate II 12a)

1	]	θ	μ	α	ν	[	]	..	ι	..	μ	α	
2	]	θ	ο	ι	α	γ	α	θ	ω	[	..	]	υ
3	]	κ	λ	ο	ς	ς	α	λ	ω	[	]	ι	υ
4	]	.	[	]	ι	α	[	]	υ	μ	ε	θ	
5	]	υ	μ	ε	θ	[	]	υ	μ	ε	θ	[	

In the second line it is tempting to recognize an allusion to the magnificent verse spoken by Herakles in the Hesiodic *Wedding of Keyx* when he arrived uninvited at the wedding feast (fr. 264 M.-W.), αὐτόματοι δ' ἀγαθοὶ ἀγαθῶν ἐπὶ δαῖτας ἔενται, 'good men come to good men's banquets of their own accord'. It was a famous line, alluded to by several classical writers.<sup>5</sup> If the ]υ[ is rightly read, the verse was not quoted in full. In the next line perhaps κλέος (or 'Hρα] κλέος!), or εὐ]κλεῶς or α]κλεῶς.

B 1 (= recto), left and right edges (see plate II 12b)

1	]	π	ε	[
2	]	Α	Α	[
3	]	Π	Π	Π
4	]	υ	ρ	[
5	]	η	μ	ο
6	]	μ	[	]
7	]	χ	θ	η
8	]	υ	π	ο
9	]	μ	ι	[

<sup>5</sup> Bacchylides fr. 4. 23; Cratinus fr. 182 K.-A.; Eupolis fr. 315 K.-A.; Plato, *Symposium* 174b.



The letters in line 2 are large and spidery; they are less deeply incised in the wax and seem to have been written by a different hand with a finer point. Further such letters appear just below 5 ]ημου[ : ]ΑΛΛΑΝ[. (The first two letters are on a piece of wax that has shifted down slightly below the level of the following ones.)

At the beginning of line 8 ἀ[λῆ]θῶς δ[έ] would fit the spacing but can only be accepted on the assumption that it was indented. (I can discern no traces in the space before α.) At the end of the line one thinks of ὑπὸ γον[; there appears to be no room for further letters before the edge, but below γο there is what I take to be a damaged ο, followed by a possible trace of υ. I surmise that the writer wanted to write ὑπὸ γόνου, ran out of space, and put the last two letters underneath.

At the beginning of 9 there appears to be a narrow sigma inserted after the initial omega. The λλ might conceivably be μ, but the third stroke crosses the second in such a way as to suggest a separate letter. If we assume an unmarked elision (as perhaps in B 2. 1 below), we may articulate ὥστ' ὀλλ[υ-. At the end, if not K]ιλίκων, then perhaps εἰ]μι [βαc]ιλίκων or the like. This might possibly continue the topic of breeding from 8. In these last two lines, at least, the text seems to be prose.

On B 2 a good deal of the wax surface remains, and writing is discernible in several areas if one compares different photographs; sometimes letters that are clear on one are indistinct or invisible on another. Unfortunately the strings of letters are nowhere well enough preserved to yield sense.

B 2 (= verso), left half (see plate II 10b)

1	βφ.ιδουτε[ ]εχφ.[...]. κλεα... ιπ[	
2	εμ[ ] . [ ]λ[	
3	[... ]αυηι[	
4	ωυ[ ]χ.[. ]μμ[	
5	ωκι[.]κ[	
6	[.]μν.[.]παλιπ...[	
7	[...]ωθ[ ]αγοωδ.[	
8	[.]ν[.]γλλωευν...δοποι[ ]κ[	
9	[ ]ριφ[	
10	[.]ω[ ]χμη[	
11	ιφ[ ]μ.[.]λ[	
12	[.]αιδα[	
13	]ιφ[	
14	]ολοα[	
15	[...]λ.η[ ]α.[	
16	]ιφ[	
17	]κλω.ιφ[.]ολλυτα[	

In the first line possibly βονῖ δ' or βοαῖ δ', with unmarked elision as suggested above at B 1. 9. In line 4 we have presumably either ὦ ὕ[ (ὦ 'Υ[) or an Ionic ὦ ὕ[τός. In 17 apparently ὀλυστα[ι.

B 2, right half (see plate II 10c)

1	]ημιουδε.αρ:πη[	
2	]...[	
8	]αι[	(line-ends)
9	]χα.π[	]...[ ]:πω [
10		]τοξ[ ]ω... [
11		]...χυ [
12	]ραι[	
13		
14	]χυ[	
15		]ληπ.[
16		]φ...[

Γ 2 (= recto), lines 1–2, two thirds across

]...[  
]ν:α[

Γ 2, lines 4 to 2 from the foot, three-quarters across

]μα[  
]του.ε.[... ]κ[  
]:π[

On Δ I can discern only a few letters on each side, just enough to establish that Δ 1 was the recto (hinge at the top) and Δ 2 the verso (hinge at the bottom). In the lower left corner of Δ 1, five lines up from the bottom, I see [...].μπρϑλ[. and on the penultimate line [...]. ...:σϑ[. On the left margin of Δ 2 I see λ[ in line 3, υ[ in line 6, and ιππ[ in the third line from the foot.

## The Papyrus

I turn now to the papyrus. The story of its condition at discovery and of its restoration at the National Archaeological Museum in Athens is told in Egert Pöhlmann's paper above. The eight frames in which Antonios Glinos mounted the fragments, and which since 1996 have been kept at the Piraeus Museum, are as follows.

Frame 1: A 27091 = MΠ 7449; see plate IV 6. Several hundred fragments arranged in rows and graded in size. On a very few of them a letter or two can be made out.

Frame 2: MΠ 8517; see plate IV 7. Eight rows of small fragments. On some of them letters or syllables can be made out, but no whole word.

Frame 3: MPI 8518; see plate II 3b. A fairly large piece compacted from more than one layer. Scattered letters can be seen here and there.

Frame 4: MPI 8519; see plate IV 8. Fourteen rows of small fragments. A few contain one letter or so.

Frame 5: MPI 8520; see plate II 3a. An assembly of miscellaneous fragments, of which ten are put together from smaller pieces. I have assigned numbers 1 to 44 to fragments starting from the left of the frame. Some contain remnants of several lines of text, but not always from the same layer. In a few instances a whole word can be made out or supplemented. In several cases further letters appear between the lines; in the inventory these are taken to be probable musical notes,<sup>6</sup> but they seem in fact to be fragments of text permeated from an upper or lower layer in consequence of the damp conditions.

Frame 6: MPI 8521; see plate IV 9. Nine rows of small fragments, some bearing one letter or so.

Frame 7: MPI 8522; see plate IV 10. Sixteen rows of small fragments, a few with letter traces.

Frame 8: MPI 8523; see plates II 8ab, IV 11. This is the detached piece that Konstantinos Asimenos photographed in May 1981.

Most of the legible remains of writing are to be found in frames 5 and 8. They do not amount to much. The script is small and neat; the height of the letters is about 2 mm, only slightly larger than on the wooden tablets. The letter forms (see figure 2) show some variation, and it is hard to say positively whether the hand is the same as on the tablets or a different one. As on the tablets, the alphabet used is the Ionic.

Here are provisional transcriptions of those fragments from frames 5 and 8 that are large enough to be of possible interest.



Figure 2. Letter-forms on the papyrus.

<sup>6</sup> Εύρετήριο p. 182: Σέ δύο μεγάλα σπαράγματα σώζονται μικρά τμήματα 7/8 στίχων μέ σημεία μουσικήs πιθανώς σημειογραφίας στά διάκενα, π.χ. ΑΙΣ/ο<|.

Frame 5 = MΠ 8520

Fr. 1 (plate II 7a). The fragment has writing extending over about eight lines, but it belongs to more than one layer—perhaps four—so that one sees separate line-sequences overlapping and out of alignment.

Lowest layer	Next	Next	Next
]εζτ[	] . [	]ε[	
]ωμ[	]πον[	]θ[	]X
]χο[	]οεπ[		]ε[
	]...ο[		
5	]ορεινε[		
	]αζαε.[		
	]ηλοπιμ[		
	]παριζ[		

Fr. 3 (plate II 5a). The writing is visible only in infrared images. Two layers are combined, giving paired lines.

Lower layer	Upper layer
]ε[	]...[
]η.ο...[	]κεητο[
]ξωθ...[	]δ...[
]εκαλ.αιπ[	]αιμν...γλ[
5 ]αρχηε.ζε[	]ενηα...[
]ωψξετι[	]νω...[
]πωιτ.[	]γρ...ιω.ε[
	]αζαπα[
	<i>vacat</i>

In line 5 of the lower layer an adjective in -αρχής is probably to be recognized. Line 6, if rightly read, will have to be supplemented as κ]ωὐκέτι, that is, καὶ οὐκέτι contracted as in Ionic, not in Attic; cf. above on tablet B 2. 4 ωυ[. In line 8 of the upper layer the uncommon letter sequence might perhaps be resolved as χάλ]αζα, πά[χνη, as in Aristotle, *Meteor.* 388b11 κρύσταλλος, χίων, χάλαζα, πάχνη. Of course there are other possibilities. We have ]αζα also on fr. 1. 6 above.

Fr. 4	Permeated lines from another layer
]ι[	]τοξ.
]τρωελ[	]ζε
]νημα[...][	]ωνα.
]ιξαε[	]καγε [
5 ]πασπουδ[	
]τοκυδεε[	

In line 6, if the last two letters are rightly read, I think we have to assume an otherwise unattested compound adjective such as κλυτοκυδέες or ἀφθιτοκυδέες. This would be a definite sign of poetic diction (and dactylic rhythm). There is another such sign in fr. 5 (see below), upper layer, line 6 ]ρανιδης, which is almost certainly a poetic patronymic.<sup>7</sup> There is a Τευθρανιδης at *Il.* 6. 13, the patronymic of a Trojan named Axylos. But much more likely is Οὐρανιδης, son of Ouranos, which occurs in several places and is used especially of Kronos.

Fr. 5 (plate II 6ab). The text on the right-hand side of the fragment (upper layer) overlaps that on the left. I disregard interlinear letters (permeated text).

	Lower layer	Upper layer
		]δυεπ[
		]περη[
	]ινοπ[	]εε[
	]εχ[	]δαισιτ[
5	]αφ[	]ιμογ[
	]ω[	]ρανιδηςπ[
		]κατ[
		<i>vacat</i>
Fr. 8	]αππε[	
	<i>vacat</i>	

The reading of fr. 8 is quite clear and unambiguous. The uncommon sequence of letters again points strongly towards a poetic text, more specifically an epic or lyric one. In prose it would, I think, occur only in ὦ πάππε, ‘O grandfather’, which is indeed found a number of times in Xenophon’s *Cyropaedia* but is in general unlikely to be encountered. In poetry there would be several possibilities. Much the most frequent forms containing these letters are κάππεσε, κάππεσον, ‘fell down’. There is also the phrase κάπ πεδίον ‘in the plain’ (twice in the *Iliad*); there are forms of ἀππέμπω ‘send away’ (*Od.* 15. 83, Sappho fr. 27), and there are a couple of other Lesbian forms in Alcaeus that contain this letter sequence.

Frame 8 = ΜΠ 8523

Here again we have parts of more than one layer of papyrus. The photographs taken by Asimenos in Athens in May 1981 (plate IV 11) show the item as it was

<sup>7</sup> ἰδης is excluded in a text of this date by the absence of iota. ἰδης is theoretically possible; cf. below on ΜΠ 8523 E 3.



before restoration, with parts of as many as five layers overlapping and stuck together. In the course of restoration the layers were loosened, some pieces changed position, and there was some slight damage at the edges. There was gain as well as loss, as the operation revealed parts of the text on a lower layer that had been hidden, while covering up part of the top surface that had been visible. For the present appearance of the fragment see plate II 8ab.

Once again the inventory notes the presence of interlinear letters, in particular in the third line from the top, and speculates that they might be musical notation.<sup>8</sup> In actuality they represent permeated text from other layers, something that is to be seen all over the fragment, especially in infrared images.

Here is an attempt to distinguish and transcribe the various layers, based on comparison of the 1981 photographs with those taken in the Piraeus Museum in 2010 and 2011.

A: top layer<sup>9</sup>

5                   ].c[  
                    ]ωδ[  
                    ]...[  
                    ].[    ]λ.[  
                    ]..[    ]..[  
                    ]....[  
                    ]οιτογὰδ[  
                    ]λεττοπερ[

C: third layer<sup>11</sup>

                    ]αιδεμο[  
                    ]εμ[  
                    ]αρχαιουτι[  
                    ]επτὰ.[  
                    ]ε[

B: second layer<sup>10</sup>

                    ]ζαινθ[  
                    ]ιοζρν.[  
                    ]θαγεπο[  
                    ].ωστὰ.α[  
5                   ]παιπ[

D: fourth layer<sup>12</sup>

                    ]ρησα[  
                    ]τοαν[  
                    ]εσιαγ[  
                    ].λ[

<sup>8</sup> Εύρετήριο p. 182: Διαβάζονται τμήματα 7/8 ἐπαλλήλων στίχων, μέ στοιχεία μουσικῆς πιθανότατα σημειογραφίας στὰ διάκενα. "Υψος γραμμάτων περί 0.001 μ. Δειγματολογικά ἀναφέρεται: 3ος ἐκ τῶν ἄνω στίχος: ΑΥΙΔ\ΟΞΧ\ΣΙΑ.

<sup>9</sup> Plate IV 11, bottom centre; no longer present in the more recent photos.

<sup>10</sup> In the 1981 photos (plate IV 11) this occupies most of the lower left quadrant, being overlapped by A. Now (see plates II 8b, IV 11) it is broken into two pieces, one of which appears as a detached fragment to the left of the main papyrus, while the other covers the bottom right corner.

<sup>11</sup> Lower left quadrant; formerly mostly hidden behind B.

<sup>12</sup> Upper right quadrant.

E: fifth layer<sup>13</sup>

].[  
 ].ιτρεπ[  
 ]πολυιδα[  
 ]ρεχωμε[  
 ].ρ.[

Permeated text appearing between lines

].[  
 ]ολ.ωα. .[  
 ]θωα.[  
 ]υηναμεσ[  
 ]ηνπο[ ]μα[

One can recognize one or two words and possible word divisions, for example in C 3 the whole word ἀρχαίου. I will comment only on E 3, ]πολυιδα[. There is no compound word or name that it fits, so we must presumably divide πολὺ ἰδα[, and then it looks as if we are somehow concerned with Mt Ida, either the name Ἴδα in Doric / Aeolic form, or the adjective Ἰδαῖος, or the Trojan herald Idaïos. In any case a poetic theme is suggested.

## Conclusion

The tomb from which these texts emerged has been referred to since its discovery in 1981 as the Tomb of the Poet. It is certainly a reasonable assumption that the accumulation of manuscripts, writing implements, and musical instruments indicates that the deceased was a musician and probably a poet. The instruments, at any rate, will surely have been instruments that he or she played.<sup>14</sup> The manuscripts will have contained texts that he or she owned: perhaps read, perhaps copied, possibly composed. To illustrate their inclusion in the tomb I may quote an epigram written many centuries later by the satirical epigrammatist Lucillius (*Anth. Pal.* 11. 133). It is about a tiresome poet called Eutyichides who had his musical instruments and lyric compositions cremated with him:

τέθνηκ' Εὐτυχίδης ὁ μελογράφος. οἱ κατὰ γαίαν,  
 φεύγετ'· ἔχων ᾠιδὰς ἔρχεται Εὐτυχίδης·  
 καὶ κιθάρας αὐτῷ διετάξατο συγκατακαῦσαι  
 δώδεκα, καὶ κίστας εἰκοσίπεντε νόμων.  
 νῦν ὑμῖν ὁ Χάρων ἐπελήλυθε. ποῦ τις ἀπέλθῃ  
 λοιπόν, ἐπεὶ χθιδὴν Εὐτυχίδης κατέχει;

Eutyichides the song-writer has died! You there below the earth,  
 run for it! Eutyichides is coming with his songs!

<sup>13</sup> Upper left quadrant, overlapped by D on the right and by C below.

<sup>14</sup> I say 'he or she' because we do not yet have a definitive statement of the sex of the skeleton. The harp may point to a woman. In any case it was a young person aged about 18 or 20.

He gave instructions for twelve citharas to be burned with him  
 on his pyre, and twenty-five boxes of nomes.  
 Now Charon has come to join you. Where can one go  
 in future, now that Eutychides is all over Hades too?

We have seen two or three indications of poetic diction in the texts from the Daphni tomb. It looks as if at least some of them were in verse, though it is unsafe to assume that they all were. It is also very doubtful whether there was really any musical notation on them, as the description in the museum inventory in three cases presumes. Musical notation probably did exist by this time, and if it were going to appear anywhere, it would be most likely to be found on the private texts owned by a professional musician. In the Daphni texts, however, I have not found any clear example of it, whereas I have found many places where the permeation of text through layers of papyrus has produced the appearance of letters written between the lines.

I have also noted traces of Ionic dialect. This might be due to the author's being of Ionian provenance; Ion of Chios may be recalled as an Ionian poet and lyricist living at Athena at this period (though it cannot be his tomb). But it is at least as likely that the Ionicisms are due to the use of an Ionian literary genre, whether verse or prose. For the time being we must be content to speculate.

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Plate IV 1a. Tablet B 1 (MΠ 7453). Photo E. Pöhlmann.

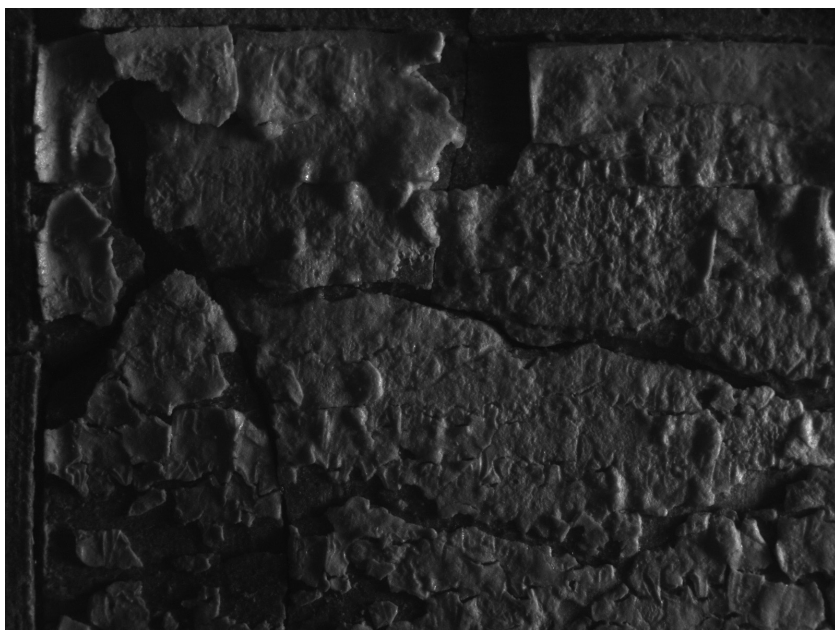


Plate IV 1b. Tablet B 2, top left (MΠ 7453). Photo A. Alexopoulou.



Plate IV 2a. Tablet Γ 1 (ΜΠ 7454). Photo E. Pöhlmann.



Plate IV 2b. Tablet Γ 2 (ΜΠ 7454). Photo E. Pöhlmann.





Plate IV 3a. Tablet Δ 1 (MPI 7455). Photo E. Pöhlmann.



Plate IV 3b. Tablet Δ 2 (MPI 7455). Photo E. Pöhlmann.



Plate IV 4. Tablet fragments (MΠ A 27045-46-47). Photo E. Pöhlmann.

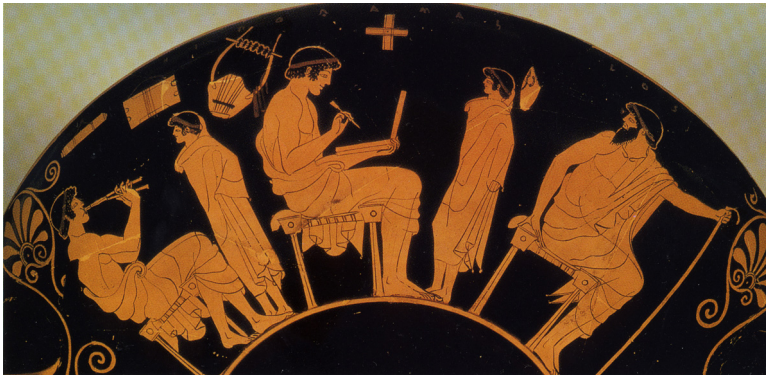


Plate IV 5. Douris Cup (Berlin 2285). Photo J. Laurentius.





Plate IV 6. Papyrus, frame 1 (A 27091 = MII 7449). Photo E. Pöhlmann.



Plate IV 7. Papyrus, frame 2 (MI 8517). Photo E. Pöhlmann.



Plate IV 8. Papyrus, frame 4 (MII 8519). Photo E. Pöhlmann.



Plate IV 9. Papyrus, frame 6 (MP 8521). Photo E. Pöhlmann.





Plate IV 10. Papyrus, frame 7 (MII 8522). Photo E. Pöhlmann.

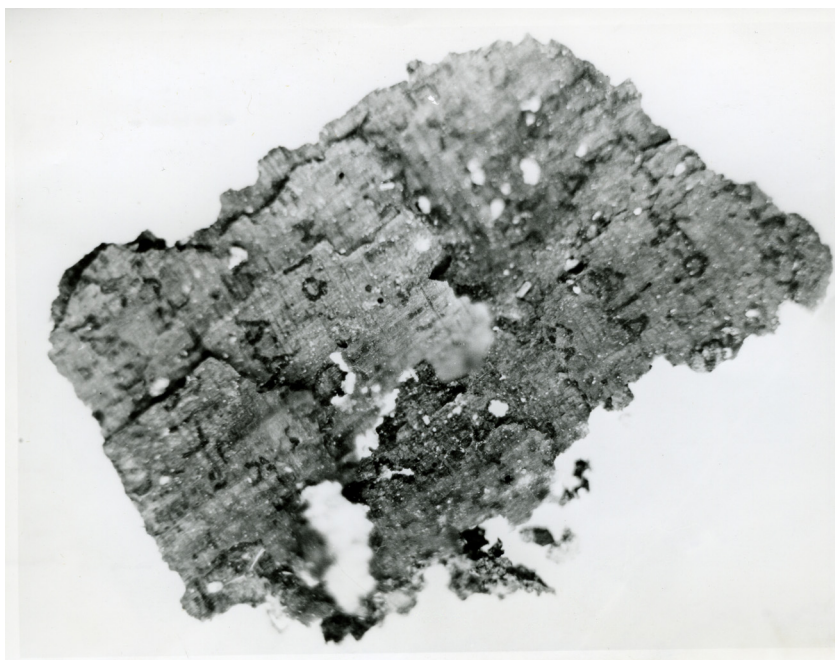


Plate IV 11. Papyrus, frame 8 (MII 8523). Photo Asimenos.



# The Daphnē Aulos

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## Abstract

The present paper concentrates on one of the musical instruments retrieved from Grave II at Daphnē, the wooden aulos. Only one pipe of the instrument, together with its bulbous mouthpiece, was found. In the organological account which follows, the pipe is described and assessed, and an attempt is made to reconstruct it and discover its scale.

Il presente lavoro si concentra su uno degli strumenti musicali recuperati dalla Tomba II a Dafni, l'*aulos* ligneo. Solo una canna dello strumento, assieme alla sua grossa imboccatura, è stata rinvenuta. Nella descrizione organologica che segue, la canna è descritta e interpretata, ed è fatto un tentativo di ricostruirla e di scoprire la scala da essa prodotta.

## Keywords

organology, Classical Greece, aulos

## 1. Introduction

In his *London Times* article of May 25th 1981 on the Daphnē excavation, Mario Modiano made no mention of the wooden aulos found in Grave II together with all other artifacts contained in it.<sup>1</sup> A year later, Gilles Touchais does mention the aulos, describing it as a “wooden instrument resembling a flute”.<sup>2</sup> The aulos fragments (together with the other wooden items from Grave II) were strengthened by a special solution, made up of one part movilit, half part acetone, and toluole.<sup>3</sup> The application of this solution is, presumably, responsible

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<sup>1</sup> Modiano 1981.

<sup>2</sup> Touchais 1982: *un instrument en bois qui ressemble à une flute*.

<sup>3</sup> Peiraias Museum Restoration Diary.

for the deep brown-almost black colour of the wooden surfaces. The fragments were subsequently glued together at the matching breaks.<sup>4</sup>

On the 4th of January 1991, during the period of his PhD research, the present writer saw the aulos at the Depository of the National Archaeological Museum, Athens, but only made a sketch of it, as he was not then allowed to measure and photograph it. The instrument had apparently undergone by then the necessary restoration work. It was briefly described in the relevant chapter of his doctorate thesis a little later.<sup>5</sup> The aulos was transferred to the Archaeological Museum of Peiraias in February 1996 (together with all the other finds of the two graves). It has not undergone any further restoration to this day.<sup>6</sup> In the 1998 book guide to the Museum, written by its Director at the time, Giorgos Steinhauer,<sup>7</sup> a paragraph was dedicated to the ‘Tomb of the Poet’, in which the aulos (together with the lyre and the harp) is mentioned, although no picture of it is printed.<sup>8</sup>

## 2. The Remains<sup>9</sup>

The Daphnē aulos comprises two pieces of wood (pl. V 1a): a smaller one in the shape of a bulb (MII 7448/NAM A27034),<sup>10</sup> and a larger tubular piece (MII 7447/

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<sup>4</sup> A number of tortoise carapace plaques were recovered from the same grave. Some of them have been placed back together, in an attempt to reconstruct the original shell, thought to be the resonator of a lyre. For a discussion of this reconstruction see Section 8, *Appendix B*, below.

<sup>5</sup> Psaroudakēs 1994 I, 274-5 and II, fig. 98.

<sup>6</sup> According to the Peiraias Museum Restoration Diary.

<sup>7</sup> Steinhauer 1998, 42-3.

<sup>8</sup> The aulos (together with the other two instruments) is again mentioned in Steinhauer 2001, 264, and an image of it (and of the reconstructed lyre soundbox) appears in the plate on that page.

<sup>9</sup> I would like to express my sincere thanks to the staff of the Archaeological Museum of Peiraias and of the National Museum, Athens, for their help and support during my study of the three musical instruments of Daphnē in collaboration with Dr Chrēstos Terzēs. I would especially like to thank Ms Ephychia Lygkourē, Director of the Archaeological Museum of Peiraias at the time, archaeologists Ms Kornēlia Axiōtē and Ms Aggelikē Poulou, and restorer Ms Tatiana Panagopoulou at the same Museum. Special thanks also go to Dr. Nikolaos Kaltsas, Director of the National Museum, Athens, at the time, and archaeologist Nomikē Palaiokrassa, for allowing me access to the Excavation Archive of the ‘Tomb of the Musician’ at Daphnē, kept at the National Museum, Athens.

<sup>10</sup> Undoubtedly, the ovoid item No 43 in the Grave Sketch (pl. I 1), not appearing in the Materials Catalogue (pl. I 9). MII and NAM stand for ‘Μουσείο Πειραιώς’ and ‘Nat. Arch. Museum’, respectively.

NAM A27051),<sup>11</sup> with circular holes along its axis. There is no difficulty in identifying the object: it is one of the two pipes of an ancient Hellenic aulos: body cylindrical; no bell at the exit; thumb hole in between holes I and II, displaced a little to the side of the ‘keel’ of the pipe; bulbous mouthpiece section—all the characteristic features of the aulos are present. Its counterpart, a second tube and bulb, are not to be found either amongst the physical remains or the items drawn in the Grave Sketch (pl. I 1). It is quite possible then that only one pipe of the pair was originally placed in the grave amongst the offerings.<sup>12</sup>

### 3. The Tube

Although part of the wall of the wooden cylindrical tube has perished, enough material survives to establish its original length: there is no doubt that the end surface of the exit is the original (pl. V 3a). The exit end shows a slight outward curvature, ending in a ring-like lip (pl. V 3b).

At the upper end of the tube there is a peripheral depression on the outside, 0.4mm in breadth (pl. V 1b). Inside the tube, at the same end, there is a socket 6.18mm deep, undoubtedly in order to receive the bulbous mouthpiece section. The overall length of the tube is 22.8cm, if measured along the curve of the tube with a flexible ruler (23cm if projected onto the longitudinal axis of the tube). Obviously, some warping of the tube has taken place over the years. The wall thickness of the tube is 2mm. The external diameter of the tube is 1.234/1.2cm (not being exactly circular in all places any more), and the internal diameter is 8mm. Enough material of the walls of the tube remains for us to be certain that holes I, T, II, III existed: I is intact, II is complete, despite the fracture of the surrounding wall, and a large part of the circumference of III is present (pl. II 2c). Thumb hole T lies, as expected, between I and II, and, as has already been said, it does not lie immediately below the line of the upper holes, but is displaced a little to the left of the ‘keel’ of the pipe, as seen by the player (pl. V 1c). It has been argued elsewhere that this clockwise shift of the thumb

<sup>11</sup> Undoubtedly, the elongated item No 46 in the Grave Sketch (pl. I 1), appearing as a number under “Woods” in the Materials Catalogue (pl. I 9).

<sup>12</sup> Had both pipes of the aulos been placed in the grave, at least parts of the second pipe would have survived, as it is reasonable to suppose that the two lay next to each other, and therefore experienced the same taphonomic ‘fate’ since the moment of their burial. On the other hand, the possibility that the second pipe was placed on the other side of the deceased cannot be ruled out. Interestingly, the third side (‘yoke’) of the harp found in the grave has also perished, without leaving the slightest sign of its existence (see the paper by Chr. Terzēs in this volume). Could it be that the instrument was offered in this form, with its yoke missing?

tube		I	T	II	III	IV	exit
reed	mouthpiece	O	●	O	O	O	
0	6.4	8.85	11.2	13.5	16	22.8cm	
	6.4	2.45	2.35	2.3	2.5	6.8	

Fig. 1. Daphnē aulos: distances of holes from upper 'lip' of tube.

tube		I	T	II	III	IV	exit
reed	bulb	O	●	O	O	O	
0.7	0.656	0.692	?	?	?	diameters (cm) ↔	
0.654	0.628	?	?	?	?	diameters (cm) †	

Fig. 2. Daphnē aulos: longitudinal (↔) and transversal (†) 'diameters' of the holes.

hole indicates a left hand pipe.<sup>13</sup> It has also been argued that the left pipe in an aulos is the longer of the two members. Therefore, the pipe which we possess is, it is believed, the long one in the pair; we have lost the short pipe.<sup>14</sup> Part of the arc of the edge of a hole further down indicates the place of a hole IV (pl. V 2a). Below hole IV the wooden wall of the tube has perished, so there is no sign of, at least, a hole V (pl. V 2b). None of the holes have a recess around their periphery; there are several similar instances in the auletic record, where finger holes (other than vent V) are not recessed.

The distances of the finger holes (centres) from the upper 'lip' of the tube, as measured with a flexible ruler along the curve of the tube are given in fig. 1. The distance between hole IV and the exit is 6.8cm, a value large enough to have admitted a hole V, if required. The distances between the holes differ between themselves by small amounts, of the order of 0.5, 1, or 2mm. Usually, distances between holes vary by greater amounts (pl. V 9).<sup>15</sup>

It was possible to measure the diameters of holes I and T (both along the tube axis and across it), the longitudinal value of II, and nothing of III and IV, as not enough material survives in those places (fig. 2). The best readings are, of course, of hole I, as this is the only hole around which there is no crack or loss

<sup>13</sup> Psaroudakēs 2008, 202 and Psaroudakēs 2012, 524 with n. 24.

<sup>14</sup> In the long (L) pipes of all three surviving aulos pairs (Elgin, Pydna, Poseidōnia), the thumb hole (T) is located to the left of the 'keel' of the pipes, as is the case with the Daphnē pipe.

<sup>15</sup> The warping of the wood occurs below hole III, and is likely to have affected only distance III-IV. Holes I-T-II-III are still in alignment. For a concordance between the alphabetic symbols used in this paper for 'naming' the mentioned extant auletic fragments and their excavation or inventory numbers, see Section 7, *Appendix A*, below.

of material. The holes are practically circular, the difference between longitudinal and transversal values being of the order of under half a millimetre. The value 7mm for the diameters of the holes is, therefore, a reasonable mean.

#### 4. The Bulb

The wooden bulb is of the same material, colour and finish as the tube (pl. V 1b). Its surviving length is 3.638cm. Since a second pipe and a second bulb do not exist, it is assumed that the bulb, as has already been said, belongs to the pipe described above.<sup>16</sup> The left end, despite the absence of material, retains its original lip. A very fine, narrow and shallow depression around the circumference of this end, and, very probably, a slightly conical inlet without a socket for the reed stem, strongly suggest, if they do not prove, that this was the reed end of the bulb.<sup>17</sup>

The other end of the bulb is broken; some material is missing. This means that we do not have the whole original length of the mouthpiece. Having established that the other side of the bulb is the reed inlet, it follows that this end is the part of the mouthpiece section which was inserted into the tube, the 'neck', so to speak, of the mouthpiece. The upper curve on the tube side of the surviving bulge (pl. V 1b), which, obviously, has not, as yet, streamlined itself with the tube, suggests that the whole of the neck is missing. Undoubtedly, as would be expected, the break occurred at the structurally weakest point of the section, that is, the transition from the bulge to the neck.<sup>18</sup> If 'x' were to be the missing length of the mouthpiece section, then the original overall length could be expressed as  $3.638 + x + 0.618$  cm, the latter value being the depth of the socket on the extension section, the receptor of the neck. An attempt will later be made to calculate the value of the missing 'x'.<sup>19</sup>

There is a small hole with a 0.8mm diameter through the wall of the bulb at a distance of 1.55cm from the reed end lip, and at the point of maximum external diameter of the bulb (1.138cm) (pl. V 1b). It is very unlikely that the hole is the result of taphonomy (e.g. damage due to wood-worm), since there is only

<sup>16</sup> In any case, the two bulbs of a pair of auloi are practically identical in shape and size.

<sup>17</sup> Comparable bulb sections are: Elgin (pl. V 3c), Poseidōnia (pl. V 2c), Perachōra A and B (pl. V 3d, 3e resp.), Ialysos F (pl. V 3f).

<sup>18</sup> A similar situation is observed on the Ialysos F mouthpiece section: the break has occurred at the transition point from the bulge to the neck, where the negative gradient of the outer curve becomes zero.

<sup>19</sup> Section 6, below.



one in the (surviving) part of the bulb, while no other such small hole appears anywhere along the (surviving) body of the pipe. Although such small holes appear on a number of discovered mouthpiece sections of auloi and tibiae, it is only the Agora A aulos fragment (pl. V 4a) which has it in more or less the same place, that is, on the bulging part of the mouthpiece section, as opposed to the 'cup' (*holmos*), or the neck, or the area immediately below the mouthpiece.<sup>20</sup> It is most likely that the small hole on the Daphnē pipe is related to the so-called *syrinx* of the texts, a contrivance, apparently, which was fixed to the aulos/tibia on demand, and which facilitated the production of notes in a higher register.<sup>21</sup>

So far the main pipe (tube) and the mouthpiece section of the Daphnē aulos have been described in all significant detail. Let us now place our aulos amongst the other known auloi, complete or fragmentary, in attempting to draw information which might aid us in reconstructing the Daphnē aulos.

## 5. The Daphnē Aulos in the Context of the Auletic Finds Record

i) The feature of a slightly curved pipe exit, a gentle and no doubt decorative 'bell', is known from several auletic specimens.<sup>22</sup> This lip-like end is often shown in the relevant iconography.

ii) Another common feature of the aulos tube is the ring-like depression around the external surface at the upstream end. It is found on both of the Elgin pipes (pl. V 3c), on Pydna L (pl. V 4b), Agora G,<sup>23</sup> Lindos F,<sup>24</sup> and Perachōra G, I (pl. V 4c), J.<sup>25</sup> It was probably a functional rather than a solely decorative feature: an inlaid ring of either leather or metal would have maintained a tight grip on the mouthpiece section by the tube, and would have also strengthened

<sup>20</sup> A number of extant mouthpieces do not have the little hole: it is absent from the Korinthos A-D bulbs (see Psaroudakēs 2002, 358, Pl. 20.1 for drawings), the two complete Perachōra A and B bulbs (pl. V 3d, 3e), and the Pydna ones (pl. V 4b).

<sup>21</sup> For a comprehensive study of the aulos *syrinx* see Hagel 2012 with Fig. 5, showing all the known mouthpiece sections with the little *syrinx* hole in them.

<sup>22</sup> Pipes: Elgin (pl. V 5a), Poseidōnia, Louvre, Akanthos, Pydna (only suggestively; see Psaroudakēs 2008, 207, Fig. 2). Fragments: Agora H, Akropolis C, Korinthos H, Lokroi Epizephyrioi B, Perachōra A', B', C', D', E', F', G' (pl. V 6a), Sparta I.

<sup>23</sup> See Psaroudakēs 2008, 210, Fig. 12 for a drawing.

<sup>24</sup> See Psaroudakēs 2008, 210, Fig. 13 for a drawing.

<sup>25</sup> See Psaroudakēs 2008, 211, Figs 14-15 for drawings.

the joint at this rather statically weak point along the pipes. However, this is not a feature always to be found in the auletic record.<sup>26</sup>

iii) At the upper inner end of the tube there is always a socket, which is to receive the neck of the bulb section in 'Early' auloi, or the spigot of the bulb section in later aulos types. In the auletic record there are many instances of this feature.<sup>27</sup>

iv) The distance from the top of the tube to hole I is not always recoverable. However, in complete pipes or in tubes made of wood in one piece, this distance is known (fig. 3).<sup>28</sup>

<sup>26</sup> Sparta G (see Psaroudakēs 1994, II, Fig. 126 for a drawing), an 'extension' section, and at least two 'extension' sections from Perachōra (pl. V 6b, right, second from top and last but one) do not possess this outer depression. The Poseidōnia pipes, also, lack this feature (pl. V 2c). Significantly, perhaps, all these items are of a relatively early date.

<sup>27</sup> Elgin pipes (pl. V 5b), Agora G, Lindos F, Perachōra G, I, J, K, L, M, N, O, Q (pl. V 4d), possibly R. Sparta G (see n. 23, above); Korinthos J—the latter, curiously, with sockets on both sides (see Psaroudakēs 2002, 360, Pl. 20.3 for a drawing). Similar sockets are also found on both Poseidōnia pipes (pl. V 2c), as their examination by the present writer in January 2012 at the Archaeological Museum of Paestum revealed. Amazingly enough, the depth of the sockets which receive the bulb sections in the Poseidōnia pipes are of the order of 5 or 6mm, a very shallow socket indeed. All other sockets in these pipes are from 1 up to 1.3cm. One would expect at this weak junction of mouthpiece to tube a socket of at least 1cm or more, for a better grip. A possible explanation for such a short 'spigot' on the mouthpieces could be that, when not in operation, the mouthpieces, together with the reeds in them, were stored away in the *glōttokomeion*; a long spigot might have broken more easily when withdrawn from the tube, having such small wall thickness.

I would like to express my sincere thanks to the Director of the Archaeological Museum of Paestum, Dr. Giovanni Avagliano, for granting me permission to examine the Poseidōnia/Tempa del Prete/Tomba 21 aulos. I would also like to thank the friendly people at the Restoration Laboratory of the Museum who helped me with the practicalities of my study, Ms Cynzia Marino and Mr Pietro Stasi.

Special thanks are due to my colleague Angela Bellia, for communicating to me prior to its publication an article of hers containing information on the Poseidōnia aulos (now Bellia 2011, 103 with n. 10 and fig. 47).

<sup>28</sup> Lindos F has been included in the 'short' pipes, because its top-of-tube to I distance is very small, ca. 2.68cm. It is probable, therefore, that the section belonged to the short member of the aulos pair.

Diacritics L and S stand for 'long' and 'short' pipe, respectively. The interpretation here of the Reading aulos as a left hand pipe [L], and hence the longer in the pair, is based on the clockwise shift of thumb hole T in relation with the upper holes (Landels 1968, 233, 238), according to the '4L-Rule', which states that '*longer* sections belong to the *longer* pipe in a pair, which is held in the *left* hand, and has its thumb hole, T, displaced a little to the *left* of the keel' (Psaroudakēs 2008, 202). Contra Landel's final position (Landels 1968, 238). The lowest interval of the Reading aulos scale (ca. a fourth), on the other hand, may be an indication that the pipe is not the left hand member of the pair (S. Hagel, private correspondence).

$\begin{array}{c} \text{tube} \leftarrow x \rightarrow \text{I} \\   \text{reed}   \text{bulb}   \text{extension}   \quad \circ \bullet \circ \circ \circ \quad   \text{exit} \end{array}$				
Long pipes	x (cm)	short pipes	x (cm)	difference
Louvre l	11.65	Louvre h	06.050	5.60
Elgin L	11.40	Elgin S	07.700	3.70
Akanthos [L]	?	Akanthos [S]	10.316	?
København L	10.50	København S	07.250	3.25
Poseidōnia L	09.80	Poseidōnia S	07.200	2.60
Pydna L	09.60	Pydna S	06.400	3.20
Daphnē [L]	06.40	Daphnē [S]	?	?
Reading [L]	06.20	Reading [S]	?	?
		Lindos F [S]	02.680	?

Fig. 3. Auletic record: distance (in order of decreasing value) of upper tip of tube to hole I (centre).

The table shows that as the distance from the top of the tube to hole I decreases in the long pipe of a pair, the corresponding distance in the short pipe decreases as well. A comparison between the Elgin, København, Poseidōnia, and Pydna pipes shows this parallel decrement. The Louvre pipes do not seem to comply with this rule, undoubtedly because they are of a later type, with their holes bored to a different system. Another conclusion drawn from this table is that the Daphnē aulos, although the long pipe in the pair, is still a relatively short instrument, compared with other finds.<sup>29</sup>

v) Bore diameter is a variable in the auletic record (pl. V 7). The narrowest bore is found in the small Ephesos pipe (6mm), and the widest in the Ialysos G fragment (1.318cm). The Daphnē aulos, with a bore of 8mm, matches in that respect the Louvre pipes and the Perachōra F' fragment, and is a very close 'neighbour' to the Elgin pipes.

vi) Finger hole diameter is also a variable in the auletic record (pl. V 8). The smallest holes are found in the little Ephesos instrument (5.5mm), and the largest in Perachōra I' (1.1cm). The Daphnē pipe is located in the low region of values, and it is related to the smallest Perachōra and Akropolis fragments.

<sup>29</sup> A measure of the shortness of this aulos member is given by a comparison between the lengths of the tubes (i.e., without mouthpieces) of the following auloi: Elgin L 34.4cm; Pydna L 30.35cm; Poseidōnia L 30cm; København L 28.8cm; Elgin S 31.2cm; København S 26.8cm; Poseidōnia S and Pydna S 26.5cm. The Daphnē tube is by 3.7cm shorter than the shortest S tube.

vii) Inter-hole distance is yet another variable in the auletic record (pl. V 9). As the graph shows, although there is a general tendency for adjacent hole distances to increase with increasing I-T distance (all four curves, corresponding to holes I to IV, exhibit a rightwards 'swell'), some auloi, even early ones, go against this tendency, with the most prominent discrepancy in the Louvre pipes. If the Louvre aulos were to be withdrawn from the diagram (pl. V 10), on grounds of late dating, then the curves would assume a more regular form, though not without local 'retreats', most prominently in the case of the Pydna pipes (cemetery dated as 400-350 BC), and, curiously, of the early Poseidōnia pipes (500-450 BC), and, also, of the Ialyssos D fragment. The Daphnē pipe, too, shows a regression, perhaps because the aulos was bored with a near-equidistant pattern of holes in mind.<sup>30</sup>

viii) As has already been said, the distance of hole IV to the exit of the pipe is 6.8cm, and had there been a fifth, vent hole (V), the question would arise whether its position could be located. The presence of a hole V would, in any case, influence only the lowest note of the aulos, the *bombyx*, and not the rest, the upper part of the scale. The question will, for the time being, remain pending.

## 6. Reconstruction of the Daphnē Aulos

A large number of similar, 'Early' aulos bulbous mouthpiece sections have been recovered from excavations. The nearest to the Daphnē mouthpiece are, of course, those of the Elgin pipes (pl. V 3c).<sup>31</sup> Bulbous sections with necks are also found on several complete auloi, such as the København, Poseidōnia (pl. V 2c), Pydna (pl. V 4b), and Akanthos (pl. V 4e) instruments. Amongst the fragments, similar bulbous sections are items Ialyssos F (pl. V 3f), and Perachōra A and B (pl. V 3d, 3e). Thus a characteristic feature of the 'Early' aulos is that the bulbous section has a long neck, which is inserted directly, without a spigot, into the socket of the next section ('extension'). In this way, the external diameter of the bulb's neck is narrower than the external diameter of the extension.<sup>32</sup>

<sup>30</sup> See the paper by S. Hagel in this volume.

<sup>31</sup> It has been argued elsewhere (Psaroudakēs 1994 I, 280-286 with II, Figs. 102-104) that the bulbs of the Elgin aulos in the British Museum have not been placed back correctly in their original positions. Instead of embracing the surviving stems coming out of the tube sockets, they should be the continuation of these stems, which are, in essence, part or the whole of the 'missing' necks of the mouthpiece sections of this aulos.

<sup>32</sup> The feature is best exemplified on the Poseidōnia aulos (pl. V 2c).

aulos		bulb length	b	n	b/n	Daphnē neck (cm)
Perachōra	A	6.600	3.500	3.10	1.129	3.222
Ialyssos	F	7.076	3.938		1.254	2.901
Pydna	L	[7.556]	[4.128]	3.43	1.203	3.024
	S	7.556	4.128	[3.43]	1.203	3.024

Fig. 4. Auletic record: bulb sections.

	tube		I	T	II	III	IV	
reed	mouthpiece		O	⊙	O	O	O	exit
0	5.92	12.32	14.77	17.12	19.42	21.92	28.72	cm
	5.92	6.4	2.45	2.35	2.3	2.5	6.8	(cm)

Fig. 5. Daphnē aulos: distances of holes from upper 'lip' of mouthpiece.

Three bulbous mouthpiece sections can be measured with certainty or near certainty: Perachōra A, Ialyssos F, and Pydna. In fig. 4 values are given for the bulging length (b) and neck length (n) of the mouthpieces, and for the ratio bulge:neck (b/n). It can be observed that the ratio b/n values are very close to each other, ranging from 1.129 to 1.254cm (mean value 1.2cm).<sup>33</sup> By applying these three ratio values to the Daphnē mouthpiece, three neck lengths can be calculated for it, ranging from 2.901 to 3.222cm.<sup>34</sup>

As the Daphnē aulos is the shortest of the extant L pipes, the value of 2.901cm is here adopted as a best approximation. Thus, the overall length (l) of the Daphnē mouthpiece becomes 3.638+2.901 (bulge+neck) = 6.539cm. The exposed length (l°) of the section then is 6.539-0.618 (overall length-socket) = 5.92cm. The missing neck (x) is, thus, 2.901-0.618 (neck-socket) = 2.283cm. The exposed length of the pipe, thus, is calculated to be 5.92+22.8 (l°+tube) = 28.72cm (fig.5).

A replica of the Daphnē aulos in beech wood turned on a lathe, corresponding exactly in all respects to the above reconstruction and furnished with an 11mm wide, 2.5cm extrusion length reed, produced the ascending series of intervals tetrachord-tone-semitone-tone-tone, which, in ancient theoretical terms, can be described as two disjunct tetrachords (4chord-tone-4chord): a lower one, comprising only the fixed notes (*hestōtes phthoggoi: hypatē-mesē*), and an upper, complete tetrachord (*paramesē-tritē-paranētē-nētē*). The upper

<sup>33</sup> Interestingly, the Perachōra A ratio (1.129) is very near the 9:8 ratio (1.125); the Ialyssos F ratio (1.254) very near the 5:4 ratio (1.25); the Pydna ratio (1.203) very near the ratio 6:5 (1.2).

<sup>34</sup> By solving for n in the equation: Daphnē b/n = 3.638/n = other ratios in turn.



tube		I	T	II	III	IV		
reed	mouthpiece	O	●	O	O	O	exit	
0	2.5	8.42	14.82	17.27	19.62	21.92	24.42	31.22cm
2.5	5.92	6.4	2.45	2.35	2.3	2.5	6.8	(cm)
		do#	si	la	sol#	fa#	do#	
		t	t	s	t	4chord	diatonic	
		do#	la#← la	sol#	fa#	do#	chromatic	
		tr	s	s	t	4chord		

Fig. 6. Daphnē aulos replica: distances of holes from upper ‘lip’ of reed and scale.

tetrachord may be either diatonic (semitone-tone-tone) or chromatic (semitone-semitone-trihemitone), according to whether the thumb hole T is utilised or not: by employing hole T, the diatonic series (*sol#-la-si-do#*) is produced; by blowing a little harder on the *tritē* (hole II open), and not engaging hole T, the chromatic series (*sol#-la-la#-do#*) is formed (fig. 6).

The upper three notes (*la-si-do#*) in the scale, but not the lower ones, may be raised by a whole semitone if the strength of the breathing is increased a little. Thus, *la* can go up to *la#*, as already said, *si* can rise to *do*, and *do#* can easily reach *re*. The tonal level of the scale is from *do#*<sup>4</sup> up to *do#*<sup>5</sup>.

## 7. Appendix A: Extant Aulos Sections Mentioned—A Concordance<sup>35</sup>

Agora G (BI 645).

Korinthos A (MF 9173), C (MF 9043), H (MF 4770A), H (BI 594), B (MF 8975), D (MF 3628), J (MF 4159).

Lokroi Epiz. A+B (Lucif. T. 1050).

Perachōra A (A 428), B (A 424), G (A 432), I (A 423), J (A 421+A 422), K (A 414), L (A 418), M (A 419), N (A 420), O (A 417), Q (A 412), R (A 415), A' (A 404), B' (A 395), C' (A 396), D' (A 402), E' (A 399), F' (A 401), G' (A 398), I' (A 394).

Sparta A (CLXI.1c), B (-), C (-), D (CLXI.1b), E (-), F (-), G (CLXI.1a), H (-), I (CLXI.3), J (CLXI.4), K (-), L (CLXI.2), M (-).

Ialyssos F (7928), D (7931), G (7930).

Akropolis C (7209).

Lindos F (453).

<sup>35</sup> For the relevant bibliography, and a table bringing together a large selection of auloi and fragments, see Psaroudakēs 2002, 335, n. 4, and 356, Pl. 18.

## 8. Appendix B: The Daphnē Lyre

A number of tortoise carapace plaques were collected from Grave II. They were from the beginning thought to be parts of a lyre sound box. They appear in the Materials Catalogue (pl. I 9) under 'Pieces of a tortoise carapace', and are given the numbers 26, 28, 31, 33. In the Grave Sketch (pl. I 1) numbers 28 and 31 appear in the area between the right lower leg of the skeleton and the nearby sarcophagus wall, while number 33 is located on the other side of the skeleton, next to the proximate wall. Number 26 is not included in the Sketch. Given the fact that the burial was found undisturbed, it would be logical to infer that Group of plaques 28+31 and Group of plaques 33 belonged to different shells.

In the Archaeological Museum of Peiraias, a number of plaques have been joined together in an attempt to reconstruct the original carapace, and this is now on exhibition (pl. V 11). A few more plaques, not in a good state of preservation, are kept in a box in the Laboratory of the Museum. The missing plaques in the recreated shell and various small gaps have been filled in with special crystalline wax. A comparison, however, between this shell and any of the three Hellenic species of *Testudo* (*Graeca*, *Hermann*i, *Margina*ta), proves that the Daphnē reconstruction contains a larger number of plaques than it ought to (pl. V 12, pl. V 13).<sup>36</sup> The Daphnē shell cannot, as a result, be studied as a lyre resonator, until the plaques have been correctly reassembled.

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<sup>36</sup> Ancient tortoise carapaces retrieved during excavations exhibit the same pattern of shell plaques and the same number of plaques with those living today in the country. A very good example is the best preserved of the two lyre resonators discovered at Ambrakia (see Zachos 2003, 165, fig. 54).

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Plate V 1a. Daphnē aulos: bulbous mouthpiece and tubular body.  
Photo: Author.



Plate V 1b. Daphnē aulos (detail): bulb and upstream end of tube.  
Photo: Author.



Plate V 1c. Daphnē aulos: tube underside, with thumbhole T.  
Photo: Author.



Plate V 2a. Daphnē aulos (detail): part of the tube, with holes II, III, IV.  
Photo: Author.

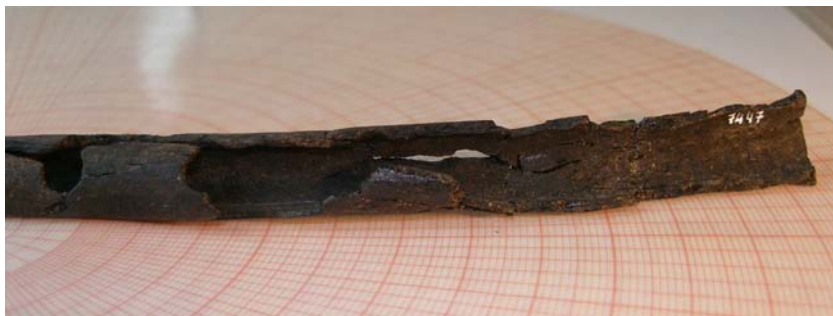


Plate V 2b. Daphnē aulos (detail): the end part of the tube. Photo: Author.



Plate V 2c. Poseidōnia aulos (detail): mouthpieces, extensions and part of the  
central sections. Photo: Author.





Plate V 3a. Daphnē aulos (detail): downstream end of tube in frontal view.  
Photo: Author.



Plate V 3b. Daphnē aulos (detail): downstream end of tube in profile.  
Photo: Author.



Plate V 3c. Elgin aulos (detail): bulbs and upper parts of tubes.  
Photo: Author.



Plate V 3d. Perachōra A mouthpiece section. Photo: Author.



Plate V 3e. Perachōra B mouthpiece section. Photo: Author.



Plate V 3f. Ialysos F fragmented mouthpiece section. Photo: Author.

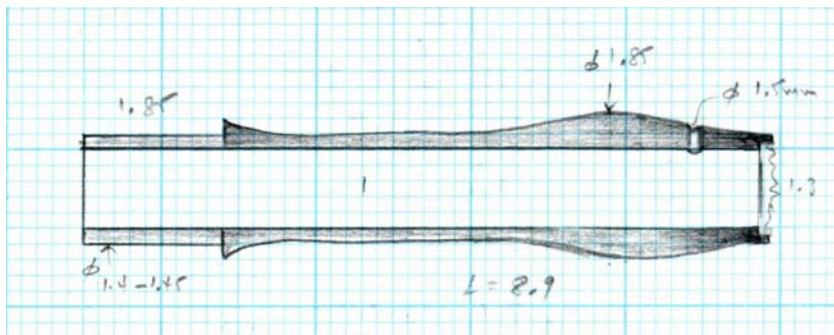


Plate V 4a. Agora A mouthpiece section: drawing 1:1 reduced.  
Photo: Author.



Plate V 4b. Pydna aulos (detail): mouthpieces and extensions. Photo: Author.



Plate V 4c. Perachōra I extension section. Photo: Author.



Plate V 4d. Perachōra Q extension section. Photo: Author.



Plate V 4e. Akanthos aulos (detail): mouthpieces and extensions.  
Photo: Author.



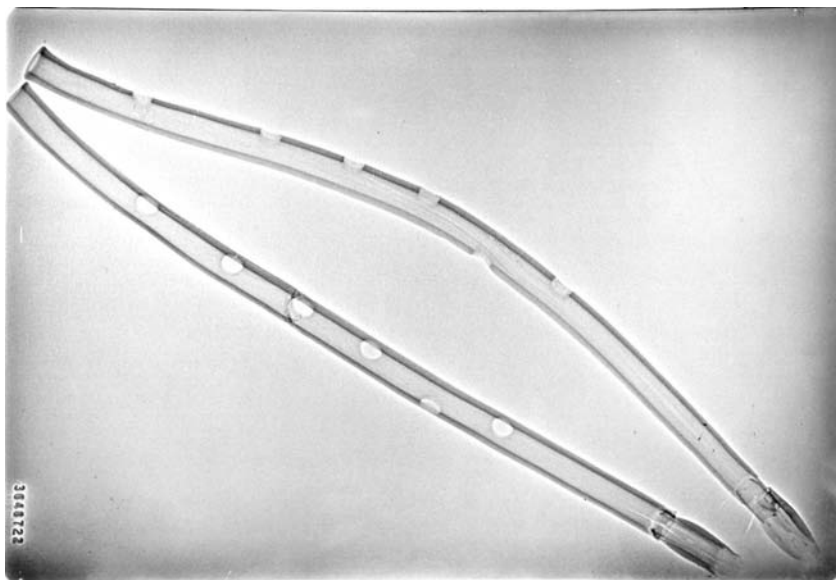


Plate V 5a. Elgin aulos: X-Ray image. Photo: courtesy of the British Museum.

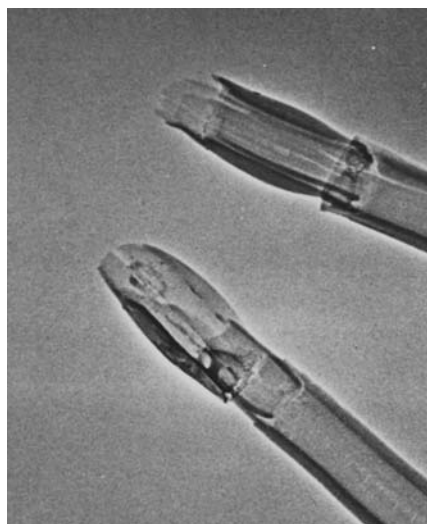


Plate V 5b. Elgin aulos (detail): X-Ray image of the bulb-tube connections.  
Photo: courtesy of the British Museum.

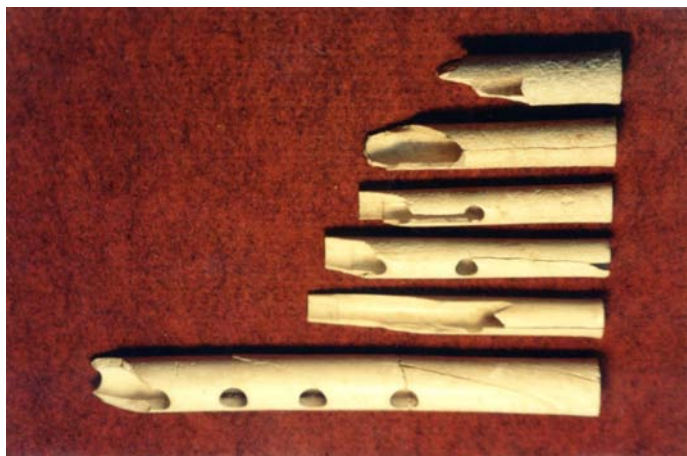


Plate V 6a. Perachōra end sections. Photo: Author.



Plate V 6b. Perachōra mouthpieces and extensions. Photo: Author.

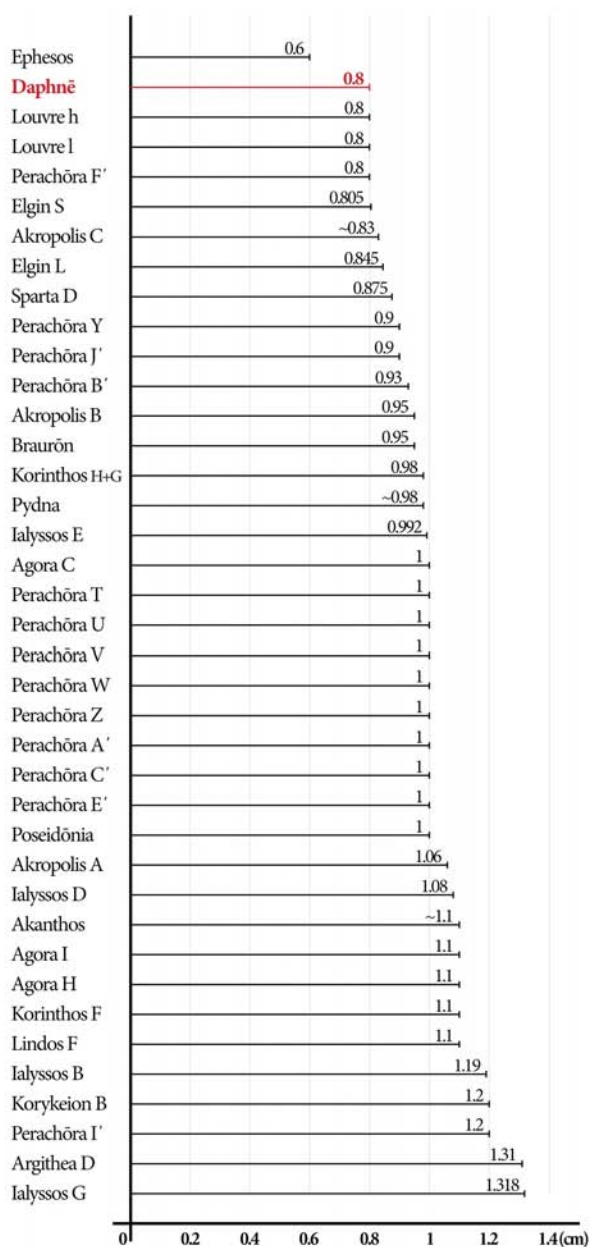


Plate V 7. Auletic record (selection): bore diameter variation.

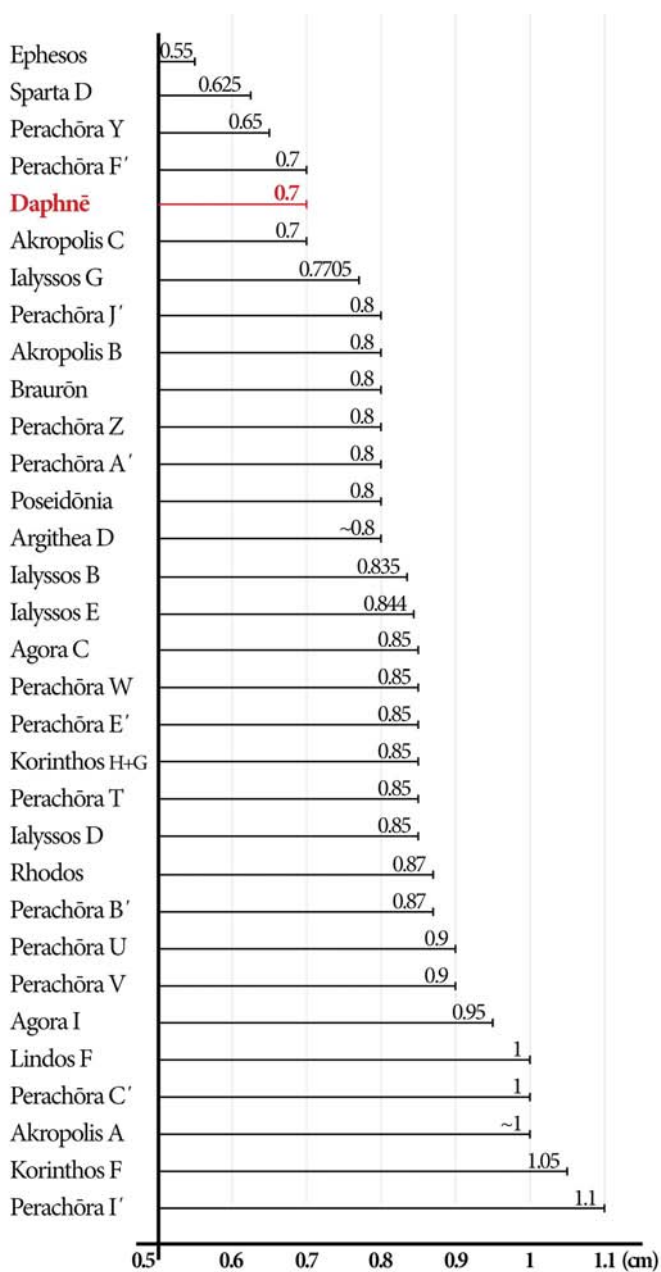


Plate V 8. Auletic record (selection): finger hole diameter variation.

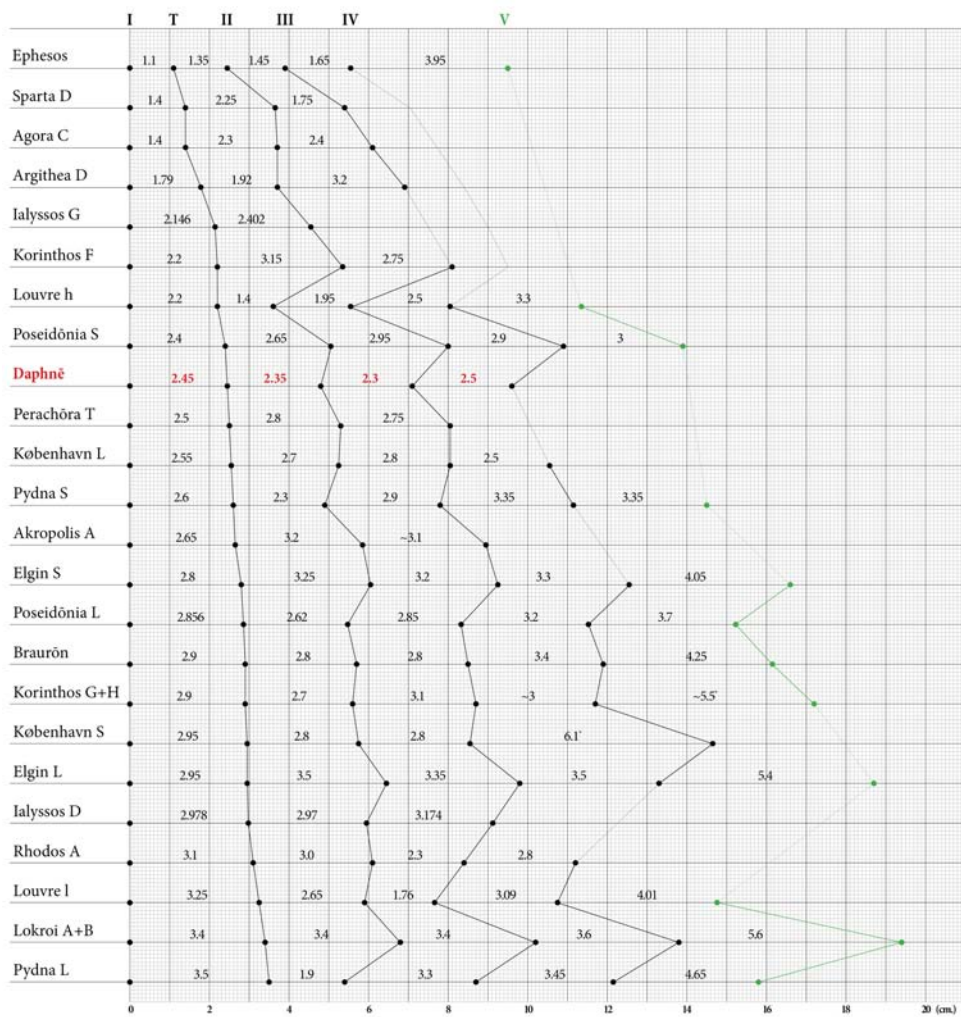


Plate V 9. Auletic record (selection): interhole distances.



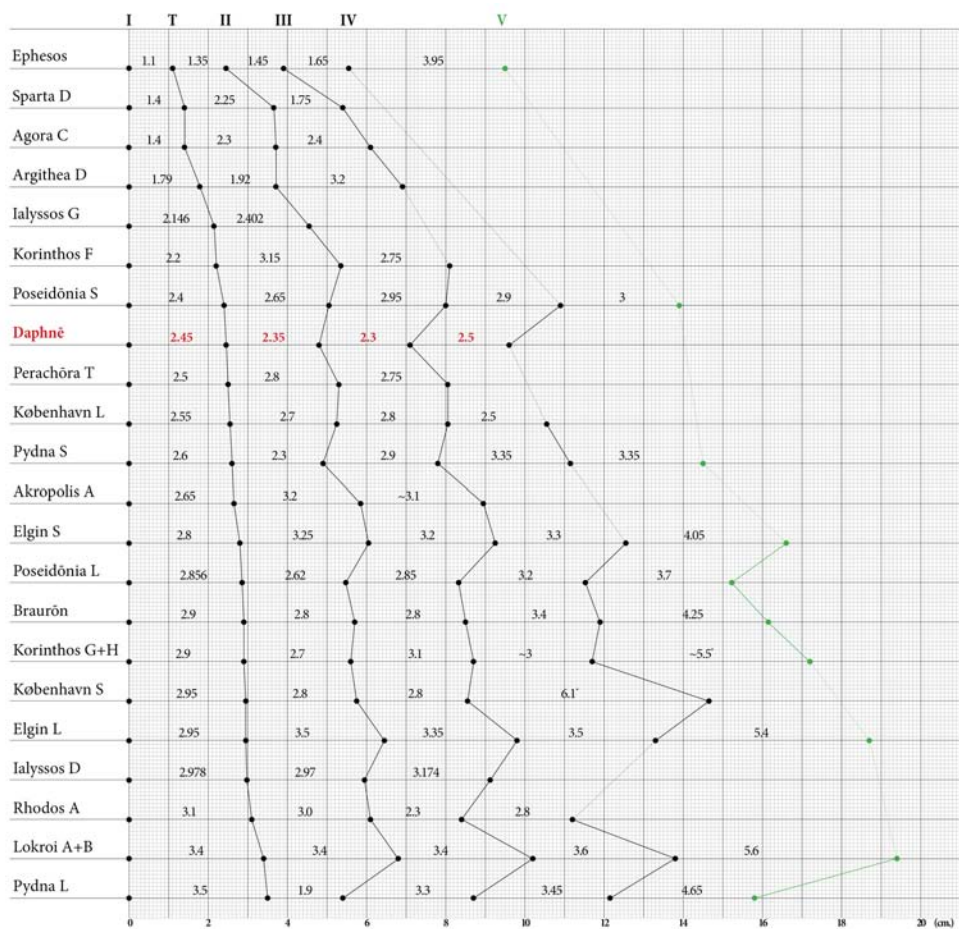


Plate V 10. Auletic record (selection): interhole distances, excluding the Louvre aulos.



Plate V 11. The reconstructed Daphnē tortoise carapace. Photo: Author.

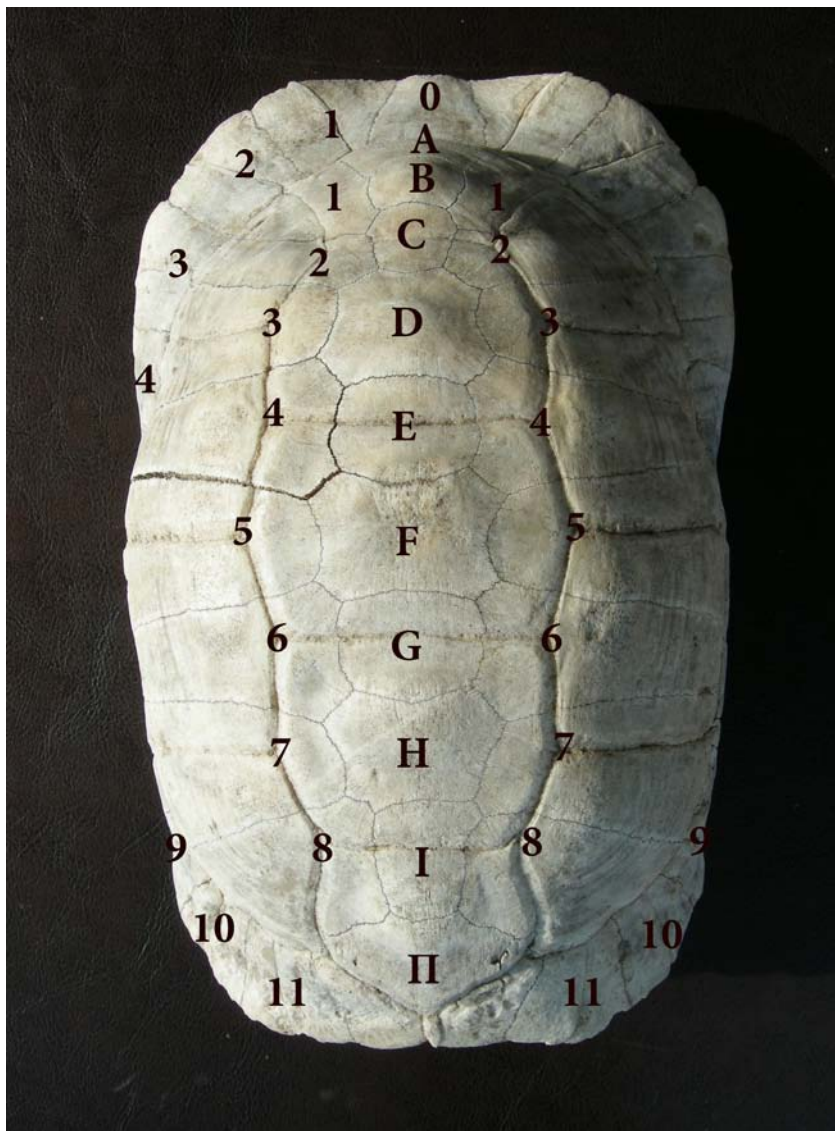


Plate V 12. Modern *Testudo Marginata* carapace with its plaques identified.  
Photo: Author.





Plate V 13. The reconstructed Daphnē tortoise carapace with its plaques identified. Photo: Author.

# The Daphnē Harp

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## Abstract

The present paper focuses on the *trigōnon* retrieved from Grave II. Only the sound box and one arm (the pillar) of the instrument have survived. In the organological study which follows, the find is evaluated in the light of the available iconography and literature, and of ancient and modern ethnological parallels. A replica was constructed in order to test the results of the analysis.<sup>1</sup>

Il testo qui presentato si concentra sul *trigōnon* ritrovato nella Tomba II. Dello strumento si sono conservati soltanto la cassa di risonanza e un braccio (il sostegno principale). Nello studio organologico che segue, il reperto è valutato alla luce sia dell'iconografia e della letteratura disponibili, sia di paralleli etnologici antichi e moderni. Inoltre per sperimentare i risultati dell'analisi si è proceduto a costruire una replica dello strumento antico.

## Keywords

Harp, *trigōnon*, organology, Ancient Greek

## 1. Introduction

The remains of the harp,<sup>2</sup> together with the other two musical instruments found in the same grave, were transferred to the Archaeological Museum of

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<sup>1</sup> I would like to express my sincere thanks to Professor Stelios Psaroudakēs for kindly including me in this research project and for the fruitful collaboration thereafter.

<sup>2</sup> The identification of the wooden remains found in Grave II as being parts of a 'harp' appears for the first time in the National Archaeological Museum, Athens (NAM) Bronze Collection Inventory compiled by archaeologist Theodōros Hēliopoulos in June–July 1993 under the numbers: 27082 (large fragment of sound box); 27083 (slender rod—two smaller fragments glued together); 27087 (small, triangular fragment of the sound box); 27088 (one fragment of the arm); 27017 (another fragment of the arm—three smaller fragments glued together); 27038 (large



Peiraias as soon as they were retrieved from the Grave, on the 15th of May 1981.<sup>3</sup> A week later, they were transferred to the National Archaeological Museum, Athens (NAM), together with all the other finds from the two Daphnē graves (except the papyrus, which had gone there from the start).<sup>4</sup> The remains of the harp, that is, the wooden sound box (three fragments), one wooden arm (two fragments), and a slender wooden rod (two fragments), were treated for stabilization by impregnation in a 1:0.5:0.5 movilith-acetone-toluole solution. Some parts were glued together by the use of the same solution, richer in movilith.<sup>5</sup> The fragments of the harp, together with all the other finds from the two Daphnē graves, were returned to the Archaeological Museum of Peiraias on 1.2.1996 (see Pl. VI 1a).<sup>6</sup> The fragments underwent further treatment: some matching parts were glued together, the sound box was internally supported at places by applying to its walls thin layers of fiberglass gauze, the gaps were filled in by special coloured wax, and, finally, the parts were assembled (under a new inventory number, ΜΠ 7458) as seen today in the Peiraias Museum Exhibition (see Pl. VI 1b).<sup>7</sup>

## 2. Identification—Dating

The shape and size of the sound box lead us to the safe conclusion that the present harp is of the triangular type, undoubtedly the *trigōnon* of the texts. The term *trigōnos/-on*, applied to a musical instrument, is first attested in the literature of the 5th century BC in a distich from Aeschylus' *Thalamopoioi*: ἀλλ' ὁ μὲν τις Λέσβιον φατνώματι / κῦμα' ἐν τριγώνοις ἐκπεραίνεται ῥυθμοῖς.<sup>8</sup> Besides, Sophocles, Aristophanes and Eupolis, all poets of the 5th century, seem to know the

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fragment of bronze decorative lamella); 27039 (one end of bronze decorative lamella in the shape of a palmette, and another six small lamella fragments).

<sup>3</sup> NAM, file "Daphnē Excavation by A. Liankouras, Grave of musician", Document 3.2/23, no. 1664/20.5.81, signed K. Asēmenos 19.5.81.

<sup>4</sup> NAM, file "Daphnē Excavation by A. Liankouras, Grave of musician", Document 4/23, signed A. Liankouras & A. Lempesē 22.5.81.

<sup>5</sup> Peiraias Archaeological Museum, Restoration Diary by Tatiana Panagopoulou.

<sup>6</sup> NAM, file "Daphnē Excavation by A. Liankouras, Grave of musician", Document 23/23, signed E. Zerboudakē 17.1.1996 and NAM Bronze Collection Inventory Book.

<sup>7</sup> Peiraias Archaeological Museum, Restoration Diary by Tatiana Panagopoulou.

<sup>8</sup> Pollux *Onomastikon* 7, 122.9-10.

*trigōnon*,<sup>9</sup> an instrument which had already been withdrawn from use by the 2nd century BC.<sup>10</sup>

The *trigōnon* features on five Athenian vases of the second half of the 5th century (see Pl. VI 2)<sup>11</sup>: on three *lebētes gamikoi* (W<sub>1</sub><sup>12</sup>, W<sub>2</sub><sup>13</sup>, W<sub>3</sub><sup>14</sup>), and one *pyxis* (W<sub>4</sub><sup>15</sup>), all four attributed to the Washing Painter (430–420 BC), and on a *pelikē* (M<sup>16</sup>) by the Meidias Painter (420–410 BC). Beyond that date the *trigōnon* does not appear in the iconography any more. Although iconography must always be treated with caution as a source of information, especially on organological matters, an assessment of the data offered by the five depictions of the *trigōnon* mentioned above is deemed necessary, for the Daphnē instrument is unique, and every piece of evidence may contribute to the present quest.

The common features of the examined depictions are: 1) the right-angle triangular shape; 2) the spindle-shaped sound box; 3) the total coverage of the sound box with skin; 4) the placement of the instrument in relation to the body of the player, where the pillar is always upright and in contact with the left arm of the harpist, the sound box far away from the body, and the head of the musician looking down onto the strings from the right, and 5) the height of the instrument, which goes beyond the top of the head of the player.

In the four depictions by the Washing Painter (W<sub>1–4</sub>) the yoke meets the sound box at a point further out from the knee of the harpist, giving the impression that the yoke is rather longer than the pillar, while, on the contrary, in the case of the Meidias Painter depiction (M), it is the pillar which seems to be substantially longer than the yoke, since the yoke-sound box junction does not extend beyond the knee. Another common feature of the four instruments executed by the Washing Painter (W<sub>1–4</sub>) is the presence of five (W<sub>3</sub>) or more

<sup>9</sup> Athenaeus 4.183e–f: Μνημονεύει δὲ τοῦ τριγώνου τούτου καὶ Σοφοκλῆς ἐν μὲν Μυσοῖς οὕτως· πολὺς δὲ Φρύξ τρίγωνος ἀντίσπαστά τε Λυδῆς ἐφυμνεῖ πηκτίδος συγχορδία, καὶ ἐν Θαμύρᾳ. Ἀριστοφάνης δ' ἐν Δαιταλεῦσι καὶ Θεόπομπος ἐν Πηνελόπῃ, Εὐπολὶς δ' ἐν Βάπταις φησὶν ὅς καλῶς μὲν τυμπανίζει καὶ διαψάλλει τριγώνοις.

<sup>10</sup> Athenaeus 14, 636f: Ἀπολλώδωρος δ' ἐν τῇ πρὸς τὴν Ἀριστοκλέους ἐπιστολὴν ἀντιγραφῇ, «ὁ νῦν, φησὶν, ἡμεῖς λέγομεν ψαλτήριον, τοῦτ' εἶναι μάγαδιν· ὁ δὲ κλειψίαμβρος κληθεῖς, ἔτι δὲ ὁ τρίγωνος καὶ ὁ ἔλυμος καὶ τὸ ἐννεάχορδον ἀμαυρότερα τῇ χρεῖᾳ καθέστηκε».

<sup>11</sup> Images in Plate VI. 2 drawn from Bundrick 2005, 33, fig 20 (W<sub>1</sub>); H<sub>1</sub> in Paquette 1984, 194 (W<sub>2</sub>); H<sub>2</sub> in Paquette 1984, 194 (W<sub>3</sub>); H<sub>13</sub> in Paquette 1984, 201 (W<sub>4</sub>); Maas & Snyder 1989, 164 fig. 16 (M).

<sup>12</sup> NAM 14791; cf. pl. 19 in Kauffmann-Samaras 1985, 25; Bundrick 2005, 33, fig 20.

<sup>13</sup> Metropolitan Museum of Art, New York 16.73; cf. Richter and Hall 1936 pl. 147, West 1992 pl. 22, Bundrick 2005, 32 fig 19.

<sup>14</sup> Metropolitan Museum of Art, New York 07.286.35; cf. Richter and Hall 1936 pl. 146.

<sup>15</sup> Martin von Wagner Museum, University of Würzburg L 541; cf. Passeti 2004, 56 fig. 57.

<sup>16</sup> Metropolitan Museum of Art, New York 37.11.23; cf. Bundrick 2005, 55 fig. 32.

( $W_1, 2, 4$ ) parallel lines across the sound box, a feature which points towards the possible use of thongs, conceivably associated with the fixing of the skin onto the sound box.

In  $W_1$ ,  $W_2$  and  $W_4$ , a clearly arched-shaped line runs along the best part of the sound box, probably a slender, flexible, wooden rod, possibly connected with the tightening of the skin, or simply a decorative motif painted onto the skin, like some other such motifs all over the sound box profile.

Finally, in all five depictions, the number of strings of the *trigōnon* is fifteen or over ( $W_2 = 15$ ,  $W_1$ ,  $W_4$ ,  $M > 15$ ,  $W_3 = 20$ ). In  $W_2$ ,  $W_3$  and  $M$ , the strings run parallel to the pillar, as they stretch from the sound box to the yoke, with the longest string next to the pillar, and the shortest far away from it. Surprisingly, in  $W_1$  and  $W_4$ , the longest string is situated in the middle of the sound box, while two similar sets of strings stretch across the frame, one to the upright pillar and the other to the horizontal yoke.<sup>17</sup> In this way, the pillar becomes itself a second yoke. The fact that both types of stringing have been given by the same painter (the Washing Painter) does not allow us to disregard the possibility of the existence of two varieties, one with all strings attached to the horizontal yoke, and another, with two sets of strings, each set ending to a different arm of the instrument.<sup>18</sup>

The examination of the discussed iconography, despite the observed dissimilarities, suggests at least that the *trigōnon*: 1) had the shape of a right-angle triangle; 2) had a spindle-shaped sound box; 3) had a skin for a sound board, stretched all over the sound box; 4) rested with its yoke along the left thigh of the player, and 5) had a large number of strings, fifteen or more.

As regards the temporal range of the existence of the *trigōnon* in general, on the one hand, the extant literature on it provides us with the span early 5th to end of 3rd century BC (Aeschylus, Apollodorus), while, on the other, the extant iconography on it gives a more narrow stretch, from 430 to 410 BC (Washing Painter, Meidias Painter). Thus, the date of the Daphnē burials, based on the white-ground *lēkythoi* of Grave I (430-420 BC),<sup>19</sup> falls nicely within the temporal limits established by the literature and iconography on the *trigōnon* (430-410 BC).

<sup>17</sup> Cf. Herbig 1929, 176.

<sup>18</sup> Contra Herbig 1929, 176.

<sup>19</sup> See the paper of Erika Simon and Irma Wehgartner above.

### 3. Description—Interpretation

For easy reference to the various parts of the instrument, symbols are here introduced, which correspond to both the numbers given to items by the excavator (see pl. I.1) and the inventory numbers given to them by NAM (table below):

		NAM	excavator
(sound box)	$S = S_1 + S_2$	27082+27087	12
(arm)	$A = A_1 + A_2$	27088+27017	11+15
(rod)	$R = R_1 + R_2$	27083	[12]
(lamella)	$L = L_1 + L_2 + L_3$	[27082]+27038+27039	[12]

S corresponds to the sound box (with  $S_1$  and  $S_2$  being the two major fragments of it); A is the surviving arm ( $A_1$  and  $A_2$  being the two fragments of it); R refers to the string holder ( $R_1$  and  $R_2$  being the two surviving parts of it); L stands for the bronze lamella along the ‘keel’ of the sound box ( $L_1$ ,  $L_2$ ,  $L_3$  being the three major pieces of it).<sup>20</sup> An expected second arm has not survived. Whether the missing arm was the yoke or the pillar of the harp will be investigated below.

#### 3a. *The Sound Box*

The sound box (see Pl. VI 3a) was undoubtedly made by hollowing out a long piece of wood. It has a boat-like shape,<sup>21</sup> with a flat ‘spine’ running down its entire length on the outside, upon which is nailed the decorative bronze lamella. This spine (see Pl. VI 3b) maintains its top width (1.764cm) down to the 29th cm of its length (1.756cm), and from there on it begins to wane gently down to the bottom end of the sound box (0.88 at 66.7cm; 0.79 at 79.5cm). There seems to be no further reduction in the width of the spine beyond that point, and over the last 4.5cm, the ‘tail’ of the sound box. The overall length

<sup>20</sup> Numbers in square brackets in the excavator column allocate items to the specified group numbers in the Grave Sketch.

<sup>21</sup> Herbig (1929, 173–4), followed by Wegner (1949, 49–50) and West (1992, 72 and 1997, 50), calls the instrument a *Spindelharfe* (spindle-harp), on the grounds of the shape of its sound box: wider in the middle, waning along its ends. Although this observation is indeed correct according to the iconography, the sound box of the *Daphnē* instrument is straight along its ‘keel’ and the upper part of its internal side, narrowing only below the middle point of the internal side. Hence it would not be appropriate to apply the term spindle-harp to the *Daphnē* instrument. It is conceivable, therefore, that the ‘spindle’ shape given by the two painters is not a realistic rendering of the actual sound box. In addition, static problems might occur if the ends—especially the top junction—were as slender as those in the depictions.

of the sound box, from the point it touches the arm (A) to the end of the 'tail' is 84cm. A triangular piece of solid wood (see Pl. VI 3c) seems to have been left uncarved at the top end of the sound box, undoubtedly to create a socket-and-spigot junction with arm A. Although the spigot has perished (see Pl. VI 3d), the rectangular socket cut into the arm is intact. Nine small nails surviving on either side of arm A all along the line of contact between the arm and the sound box (see Pl. II 1b & VI 3c) must have prevented the arm from splitting. It is interesting that the socket was opened at right angles to the arm, and not in the direction of the axis of the sound box; this was probably done to counteract the slippage due to the pulling forces of the strings.

The sides of the sound box (see Pl. VI 3b), in their present state, do not have exactly the same shape and dimensions. This is surely due to the warping and torsion which the sound box has undergone. The side which lay on the ground was affected most by the dampness of the floor, and the pressure of the weight of the sound box above it. There is no doubt the sound box was originally symmetrical about its longitudinal axis. The best surviving side should be our guide in our reconstruction of the sound box. The width of the best side is about 6cm at its junction with arm A (see Pl. VI 4a), then stays constant to about 30cm down the rim, from there gradually diminishing until it reaches 5cm at 62cm down the spine. Beyond that point, the wood breaks in a way that does not allow us to form an exact picture of the remaining part. However, the other, 'bad' side, despite its poor condition, maintains its rim down to its lower end, supplying us with the much desired information, lacking from the other side. We can therefore project the decreasing rate of the width of the 'bad' side to the 'good' side, something that will enable us to reconstruct the initial shape and size of the whole sound box.

Along the rims of both sides of the sound box, pi-shaped notches have been cut out, inside which have been placed small pegs (see Pl. VI 5a). Along the good side there are six intact notches with their pegs in place, and a reliable trace of a seventh notch. Two of the pegs are complete (the 5th and the 6th from above), the rest being fragmentary. Along the poorly preserved side there are eight notches, seven still carrying their pegs. All seven pegs are fragmentary on this side. It is very likely that a ninth peg, where the wall of the bad side has perished, existed. Similarly, at the lower end, two more pegs must be assumed at the end of the good side, in accordance with those on the other side.

Pl. VI 4b is a drawing in scale of the plan view of the sound box as it is today, with notches and pegs in their places. It is obvious from this drawing that the first peg of the bad side is missing, and that another two pegs are missing



from the lower part of the good side. All in all, there were, originally, nine pegs along the bad side and eight pegs along the good side (see Pl. VI 4c). It should be pointed out that the pegs do not bridge the opening of the sound box, but extend a little beyond the spine. Also, they are not placed facing each other, but alternate at irregular intervals: the pegs nearer the ends are close to each other, while those near the centre are further apart. It is very probable that the pegs near the tail of the sound box were a little shorter than those at the centre, as the sound box narrows down at the lower end. There seems to be a logic behind the placement of the pegs: a central one on the bad side (No. 5), is flanked by four pairs of ‘facing’ pegs on each side of it. The pairs are symmetrically arranged about the central peg. There is only one discrepancy: the second peg on the bad side should have been to the left of its counterpart on the good side. The problem, most probably, has arisen because of the warping of the sound box, caused by the loss of material at the upper end of the bad side. We could correct this flaw, by displacing the bad side a little in the direction of its original position until the problematic peg assumes a position similar to the corresponding peg on the other side of the sound box. Once this shift takes place, the ‘central’ peg moves a little towards the upper side of the sound box, so that it stands at equal distances from the outer pairs of pegs (see Pl. VI 4d).

The pegs undoubtedly supported the string holder somehow; the way in which they are fixed to the walls of the sound box inside the notches suggests this kind of function. The pulling force ( $F$ ) of the string holder on each peg could be thought of as analyzed into two perpendicular components, one in the direction of the longitudinal axis of the sound box ( $F_1$ ) and another coming out of the opening of the sound box ( $F_2$ ) (see Pl. VI 3e). The first component is balanced by the upward reaction of the sound box wall ( $-F_1$ ), and the second is counterbalanced by the reaction of the upper side of the notch ( $-F_2$ ). Thus, the outward pull on the peg which would have caused it to slip out of the notch ( $F_2$ ) is counteracted by the resistance provided by the upper wall of the notch. The upwardly curved design of the pegs is intended to transmit the forces from the point of contact with the string holder to its base, inside the wall of the sound box. The tight connection between pegs and sound box ensures an optimum transfer of vibration from the string holder to its rims whether the string holder lies above or below the pegs. Also, the overall force of the string holder onto the pegs due to the tension of the strings tends to open up the sound board, counteracting the undesirable closing up of the sound box caused by the tension of the leather soundboard.

### 3b. *The String Holder*

The long, slender, wooden, prismatic rod, seemingly wider at one end, was no doubt the string holder of the instrument (see Pl. II 1c, VI 5b). The fact that it is not shown in the grave plan suggests that it lay inside the sound box at the time of discovery.<sup>22</sup> The rod has suffered both torsion and warping. The wider end, triangular in cross section, is original. There is a small shallow hole in the middle of its face. The other, narrower, end is most probably not the original end, since it does not preserve its initial face. It is conceivable, therefore, that some part of it is missing. It will later be argued that there are static reasons why the string holder should be longer in a structure of this kind. The surviving length of the rod is 54cm, made up by two pieces safely joined together, one 15cm and another 39cm long. There are twenty-six small holes along its length, at near-equal distances (mean value 1.9cm), all of the same diameter (0.8mm), and situated on the peak side of the prismatic rod. Most probably, the rod followed the curvature of the rim of the sound box, and it is assumed that it was fixed to the pegs in some way, and along the axis of the sound box. The hole nearer the wide end stands at a distance of 3.3cm away from it, and the hole nearer the other end is at a distance of 3cm away from it. Obviously, there were no further holes for strings beyond the twenty-sixth, as the remaining distance (3cm) is larger than the average inter-hole distance (1.9cm).<sup>23</sup> The most likely position for the string holder is for it to be brought in contact with the top internal wall of the sound box at the point where the sound box meets the pillar, the reason being that a higher position of the string holder will give, as a result, a longer top string, for there would be no reason to waste valuable working space available on the instrument.

The significant question arises: where *exactly* inside the sound box should the string holder be placed? Two possibilities present themselves as the only realistic scenarios: 1) the string holder lies above the pegs ('sits' on them, so to speak), or 2) the string holder is attached to the pegs from below ('hangs' from them). In what follows, the pros and cons of each position will be evaluated:

i. *The string holder above the pegs.* Whichever the way the rod is fixed to the pegs in this configuration, care must be taken to ensure that the pegs do not interfere with the strings in any way, because this would be destructive of both

<sup>22</sup> Cf. the view expressed by the compiler of the NAM Bronze Collection Inventory Book, Theodōros Hēliopoulos, under item 27083: πιθανή ἀρχαϊκή θέση τῆς ράβδου κατὰ μήκος τοῦ ἀνοιχτοῦ μέρους τοῦ ἡχείου τῆς ἀρπας, στηριζομένης ἴσως ἐπὶ τῶν συνεχῶν ἐγκαρσίων μικρῶν ραβδίσκων.

<sup>23</sup> Interestingly, one *daktylos*—one sixteenth of the *pous* (an ancient Hellenic unit of length)—corresponds to 1.93cm.

string material and sound quality, taking into account that the holes in the rod are equidistant, at 1.9cm from each other. This, however, turns out to be impossible, since in the cases of at least three holes the strings would come into contact with the pegs (see Pl. VI 6a). A structure of this kind would, of course, produce a firm attachment of the rod to the pegs, with the result of having a good transmission of vibrations to the sound box, but leaves out of account the involvement of the (leather) sound board in the amplification of the sound: there is no direct physical contact between the board and the rod. Thus, the sound board assumes a more decorative role, rather than a functional one. A third problem with this scenario is that replacing a broken string would require opening up the leather sound board, a rather unattractive task. The way in which the leather piece was fastened to the sound box should of course be decided before a final interpretation is made of the whole structure. However, we shall postpone a discussion of the soundboard for later.

ii. *The string holder below the pegs.* In this case (see Pl. VI 6b), the string holder is attached to the pegs above it by thongs, and a close contact with the pegs is ensured by tightening the thongs as much as possible. The apex of the prismatic rod is in this set up facing downwards, and presses down onto the leather board. The strings of the instrument pass through holes opened into the ‘sandwiched’ rod and are tied onto it in the usual harp manner. The asset of this configuration is that there is no obstruction in the way of the strings, but most importantly, the string vibrations pass straight to the leather board, and from there to the sound box. A replacement of a broken string can be easily done, externally, without having to loosen up the leather. Obviously this is the best solution; the string holder lying between the pegs and the sound board.

### 3c. *The Sound Board*

We must now deal with the problem of fastening the leather board onto the sound box. As no secure marks of any kind are observed by the naked eye on the wooden walls of the sound box, and the available iconographic evidence on the *trigōnon* is not conclusive on this matter, alternative methods will be suggested, and their effect evaluated. Usually, the leather was either cut around the edges of the sound box and tied around its periphery (Pharaonic lute and Hellenic chelys), or embraced the sound box completely (Egyptian harps).<sup>24</sup> The two alternatives are assessed below:

<sup>24</sup> See Manniche 1991 pl. 5 for a tortoiseshell Pharaonic lute of the First Kingdom in the British Museum (38171); pl. 4 for a well preserved 18th Dynasty Pharaonic arched harp in the British Museum (38170), and pl. 6 for a Pharaonic angular harp of the Late Period in the Louvre (1441).

i. *Leather over the rim.* If the lyre style fastening is assumed, with the leather covering only the rim, this might not, perhaps, be enough to secure a good and constant tightening of the leather over the opening of a long box, especially across it; external thongs would have been required, which would pass over the keel of the sound box, and counteract the tendency of the tight leather to compress the opening of the box. Although iconography seems to suggest the use of such leather supports (see Pl. VI 2), no observable traces of such thongs are left on the sides of the sound box, or, even more significantly, along the edges of the keel of the instrument: the edges are square cut and are surviving in excellent condition. As there is a nailed metallic element along the spine of the sound box, the thongs must be thought of as going over it, a choice which might not be regarded as aesthetically viable.

ii. *Leather embracing the sound box.* Alternatively, if the leather covered the whole of the sound box, the metallic element along the spine could be thought of not only as a decoration, but, mainly, as a means of securing the leather onto the sound box: the lamella runs over the line of contact of the edges of the two sides of the leather, providing thus, in an aesthetic way, a cover up of a potentially imperfect 'seam'. In this set up, no supportive thongs are required, as the leather is satisfactorily tight, and the lamella is not aesthetically downgraded by been overridden by thongs. The question, of course, remains: what are the parallel lines across the sound box, which appear in the available iconography?<sup>25</sup>

### 3d. *The Nature of the Surviving Arm (A)*

Pieces A<sub>1</sub> and A<sub>2</sub> have been thought of, in the present reconstruction, as belonging to the same arm (A). Indeed, the two fragments do seem to belong together, as their cross section (1.8×2.5cm, see Pl. II 1a & VI 6c) and other formal details are the same, most characteristically, a series of alternating dark and light parallel lines cutting across their width, which seems to be a unifying factor. The significant question is: to which of the two sides of the *trigōnon* does arm A correspond; the vertical pillar or the horizontal yoke?

Had it been the yoke, that is, the arm receiving the strings at right angles and carrying the tuning mechanisms (*kollopes*), the large tension of the twenty six strings would have created an excessive moment about the A-S junction, tending to dislodge the spigot on S from its socket on A, while the (lost) pillar and its junction with the delicate end of the sound box would have suffered very high tensions, leading to fracture and collapse of the frame. In addition, the

<sup>25</sup> See Section 2 above.

rectangular cross-section of (yoke) A would not have been of a suitable shape for the rotational movements of the tuning rings.

Had arm A been the pillar, the strings would run parallel to it on their way to the (lost) yoke. In this case, the overall moment of the strings about the A-S junction would have secured the junction, and would have held the three members of the triangular frame in a statically sound state. The rectangular cross-section of the pillar would not then be a problem. Therefore, there is no doubt that the surviving member A is the upright pillar of the instrument.

There is no reason to believe that part of the length of A has been lost, despite the absence of the original face at its lower end. The gap left between A<sub>1</sub> and A<sub>2</sub> in the Exhibition layout is also not necessary, since the surviving length of A (55cm), together with the surviving length of S (84cm) and the known angle between them (50°), create a triangle with a 90° angle at the A-B junction. This result is in accord with the iconographic evidence on the *trigōnon*.

### 3e. *The (Missing) Yoke*

It has already been established that the surviving member A is the pillar and not the yoke of the instrument. The pertinent question then is: why has not even a trace of the yoke survived? On the assumption that the harp was laid inside the grave intact, with its yoke in place, the absence of the yoke must somehow be explained. There is no reason to believe that the instrument was not placed with its yoke in a horizontal position, much in the way it would have been held by a living harpist. It is reasonable to assume that, being in close contact with the damp floor of the grave, it was the part of the instrument which deteriorated first. The following scenario is most plausible:

The junctions at the extremities of the yoke deteriorate, and cannot withstand the weight of the structure (A+S) above them; the forces exerted on the frame (weight, the floor vertical reaction and the horizontal wall reaction)<sup>26</sup> create moments, which set up stresses inside the members of the structure, causing fracture at the weakest point of it; as the sound box is the most protected (covered by skin) and elastic (hollow) member of the structure, and the A-S junction is firm (spigot-socket and nails), the point which is most likely to yield under the action of the exerted forces, is where A actually broke, which

<sup>26</sup> The 'floor vertical reaction' is caused by the part of the weight of the triangle exerted on the pillar-yoke junction, A-B. Its direction is vertical (from the ground to the top of the grave). The 'horizontal wall reaction' is caused by the part of the weight of the triangle which is exerted at the point where the A-S junction meets the side wall of the grave. Its direction is horizontal (from one side wall to the other).



happens to be the thinnest part of A; the compression of A under the weight of the sound box causes a forward (towards the body) movement of the lower part of A ( $A_2$ ), which is, as a result, ejected across the body, in the place where it was found; at the same time, the sound box, with the top part of A ( $A_1$ ) still fixed to it, drops from some height to the ground rather forcefully on top of the yoke, due to the weight of the sound box, with its open end facing the wall; the top part of A ( $A_1$ ), freed from its attachment to the sound box, rotates about its axis towards the body by  $180^\circ$ , and falls next to the sound box, with its socket facing away from the wall, in the way it was found; the sound box takes its final position.

The scenario described above, that the instrument was placed inside the grave with its yoke on the floor, is highly credible because: 1) it explains the survival and the position of the pillar (A); 2) it explains the loss of the yoke, which 'sacrificed' itself, so to speak, in order for the sound box to be saved—hence its loss; and 3) it explains the orientation of both sound box and the top part of A ( $A_1$ ).

Despite the loss of the yoke, its original length can be estimated, because the lengths of the other two members of the (orthogonal) *trigōnon* are known. If  $y$ ,  $a$ ,  $s$  are the lengths of the yoke, the pillar and the sound box respectively, then, by applying the Pythagorean theorem  $y = \sqrt{s^2 - a^2}$ , the length of the yoke ( $y$ ) is found to be 66cm.<sup>27</sup> Also, the angle between the yoke and the sound box can be calculated, because the other two angles of the triangle are known, that between pillar and sound box ( $50^\circ$ ), and that between pillar and yoke ( $90^\circ$ ). As the sum of the three angles of any triangle is  $180^\circ$ , the angle between the yoke and the sound box is found to be  $40^\circ$ .

The structure of the surviving lower end of the sound box suggests that the yoke nested inside it, between the 'flaps' of the sound box on either side of it: the 'flaps' would prevent any lateral displacement of the yoke, while the 'gulfs' cut into the sound box would not allow any slippage of the yoke out of the junction (see Pl. VI 7a). Undoubtedly, the lower end of the string holder would have gone into the yoke to some little extent, in order to prevent any downward slippage of it, caused by the excessive pull of the strings. Therefore, the original length of the string holder must have been greater than the surviving 54cm; a length of 73.5cm is needed in order for the string holder to be fixed at both ends (top of pillar and end of yoke). The surviving string holder is therefore shorter than the original by 19.5cm.

<sup>27</sup>  $y = \sqrt{(84 + 3.4)^2 - (55 + 2.3)^2} = \sqrt{7638.76 - 3283.29} = \sqrt{4355.47} \cong 66\text{cm}.$

Most probably, the cross section of the yoke at its connection point with arm A must have been rectangular (see Pl. VI 7b), in order to ensure a better fit between the two members, with the yoke lying below the pillar, so that the pull of the strings strengthens the joint. However, along the rest of its length, the yoke must have been cylindrical, if it were to function as a 'yoke', with rotating leather *kollopes*. As leather tuning rings provide a good grip on the yoke, it is very unlikely that their rubbing against the thigh of the musician during playing of the instrument would cause slippage of the rings on the yoke, thus affecting the tuning. At the same time, the leather rings would prevent the whole instrument from slipping down the lap of the player.

#### 4. The *Trigōnon*: Assembling the Parts

As has already been shown, the frame of the harp can be reconstructed in its original form and size (external dimensions): sound box 84cm; pillar 56cm; yoke 66cm; angle between pillar and sound box 50°; angle between pillar and yoke 90°; angle between sound box and yoke 40°. The internal dimensions of the frame can be found by subtracting the widths of the wooden members from the respective external dimensions. This is necessary in order for the string lengths to be calculated. Given that the string holder was placed at the very top of the sound box, and that the first string hole is at 3.3cm down the rod, and having established that the 26th string hole is at 51cm down the rod, we can define the imaginary trapezoidal area within which the strings were located. It is a logical assumption that the strings were vertical, meeting the yoke at right angles (see Pl. VI 7c).

It follows that the theoretical length of the longest string is 42cm, and, as each successive reduction in the length of the remaining strings is 1.185cm, the shortest string is found to be 11.2cm. The distance between the strings is found to be 1.5cm, a value which falls perfectly within the string spacing range (1.7 to 1.3cm) we encounter in modern harps. Perhaps 1.5cm is an optimum value, so that, on the one hand, the strings can be as near the fingers of the harpist as possible, while, on the other, there is enough space on the yoke for accommodating individual leather tuning rings.

An attempt was made to build a replica, based on the results of the analysis above (see Pl. VI 8a). The sound box, the pillar, and the pegs were carved out of pieces of lime wood, chosen for its relative softness. For the string holder and the yoke the harder pink Angola mahogany was preferred. The string holder was tied to the pegs with strong waxed string, in order to ensure the best

possible contact of it with the pegs, and also in order to provide a downward pull to the pegs, which, in turn, would tend to open up the edges of the sound box. This action would counteract the tension of the stretched skin over the sound box, which would tend to close up the edges of it. The skin covered the entire sound box, as was done in ancient Egyptian harps; it was stretched while still wet, and held in position with strong clips and a small amount of diluted wood glue. For the sound board a Greek goat skin was used. Plain gut strings of 0.76mm diameter were stretched across the frame, and fixed to the yoke by leather thongs in the way it is done in our contemporary Myanmar (Burmese) harp, *saung-gauk*.<sup>28</sup> The strings were tied onto the string holder by piercing the skin on either side of the string holder at the positions of the holes. Finally, a bronze lamella was nailed all along the seam of the two sides of the leather, running down the 'keel' of the sound box (See Pl. VI 8b).

The theoretically estimated string lengths above are modified in practice, since in practice the thickness of the leather (0.5mm), the upper string knot (1mm), and the lower tuning ring (8mm) reduce the string lengths by about 1cm. Therefore, the longest string of the replica is 41cm and the shortest 10.2cm.

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<sup>28</sup> For a good photograph of the *saung-gauk* see Guttormsen 1995, 55.

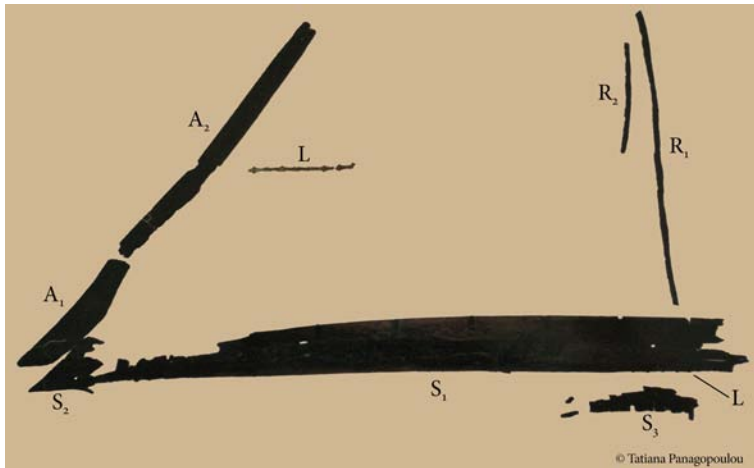


Plate VI 1a. Fragments of the harp before restoration.



Plate VI 1b. Finds from the 'Tomb of the Poet' as exhibited at Peiraias Museum.

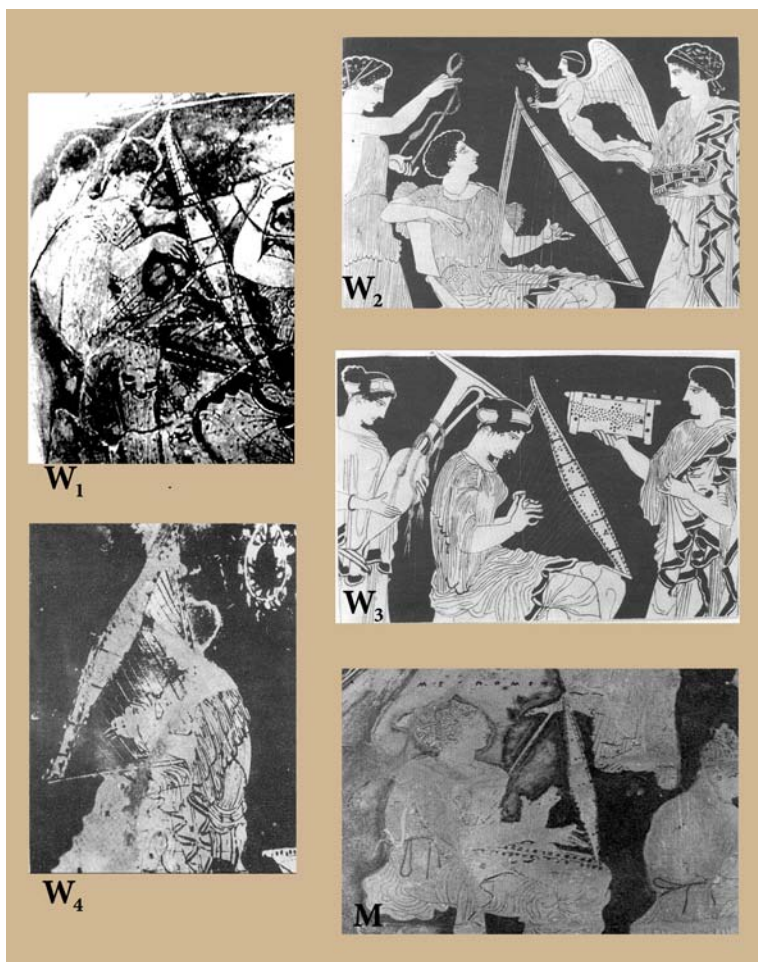


Plate VI 2. Iconography on the *Trigōnon*.





Plate VI 3a. Side view of the sound box.



Plate VI 3b. Exploded view of the three sides of the sound box.



Plate VI 3c. The top solid top of the sound box.



Plate VI 3d. Rectangular socket on arm A (pillar).

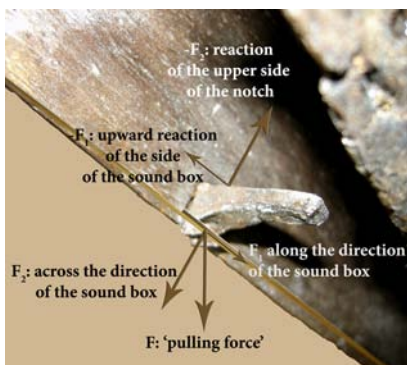


Plate VI 3e. Forces exerted on each peg.

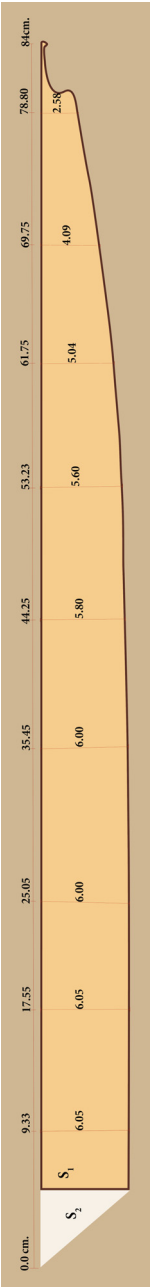


Plate VI 4a. Side of the sound box: drawing to scale.

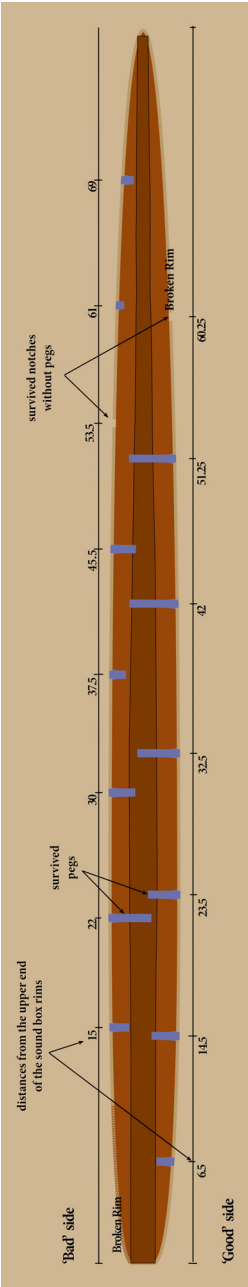


Plate VI 4b. Plan view of the sound box as it is today (drawing to scale).

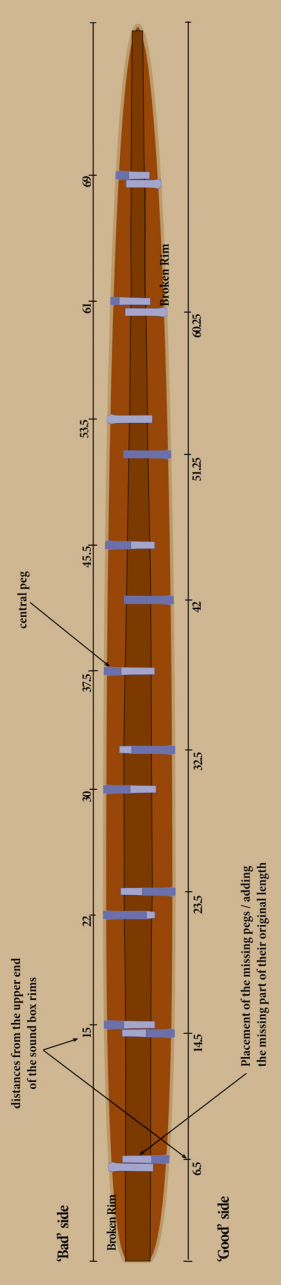


Plate VI 4c. Pegs restored in their places (drawing to scale).

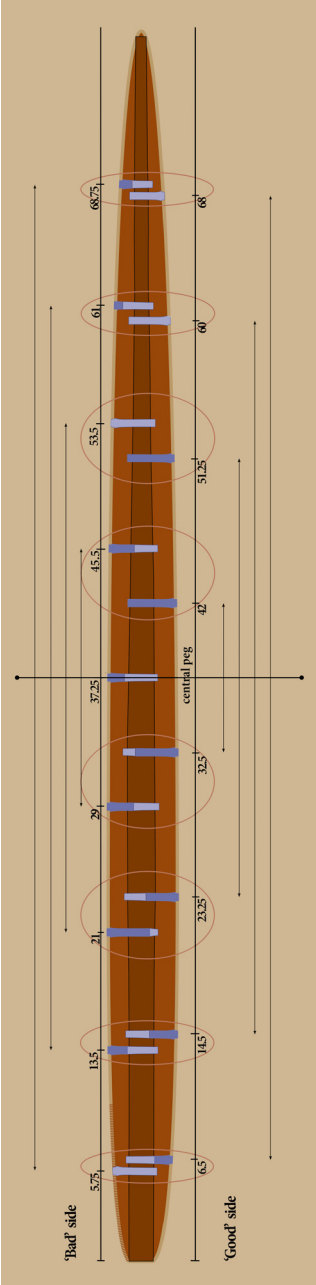


Plate VI 4d. Pegs located in their original positions (drawing to scale).



Plate VI 5a. Pegs attached to the rims of the sound box.

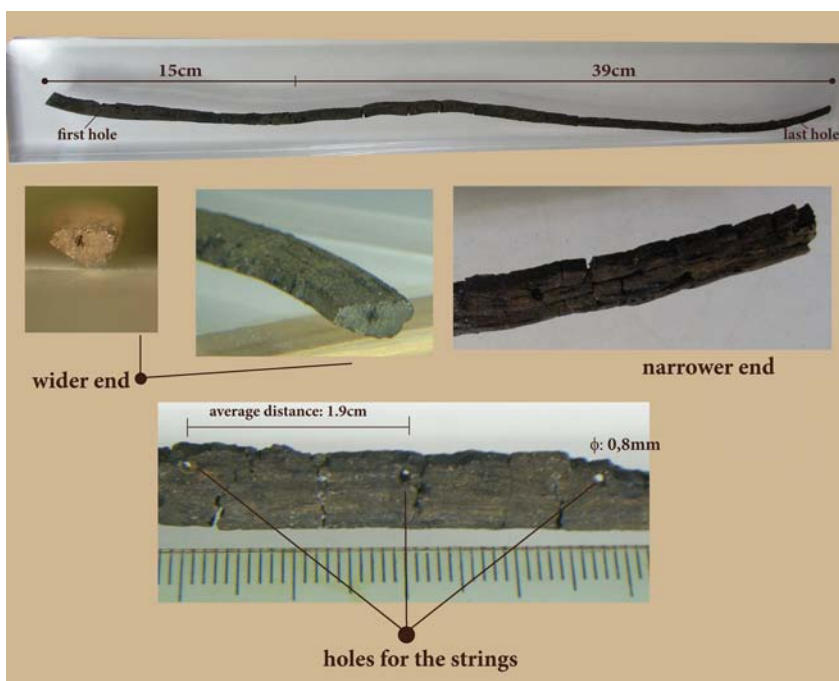


Plate VI 5b. The string holder.



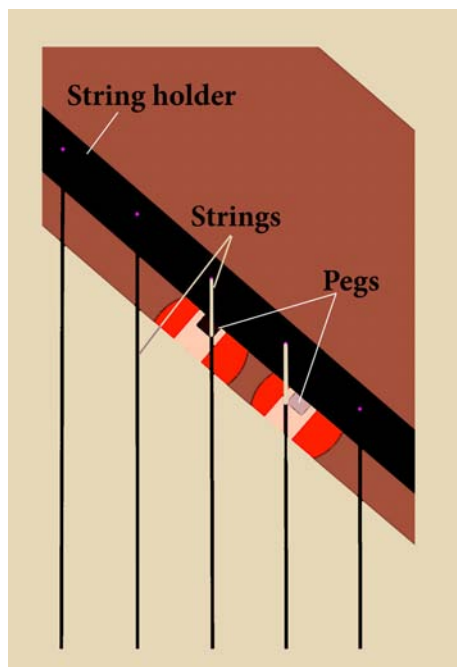


Plate VI 6a. String holder lying above the pegs (drawing to scale).

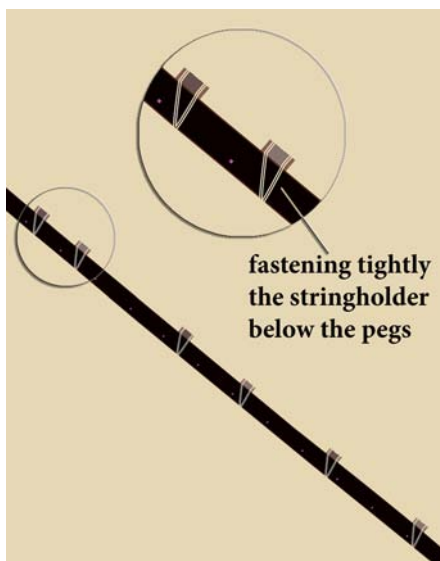


Plate VI 6b. String holder tightened below the pegs (drawing to scale).



Plate VI 6c. Components of Arm A.

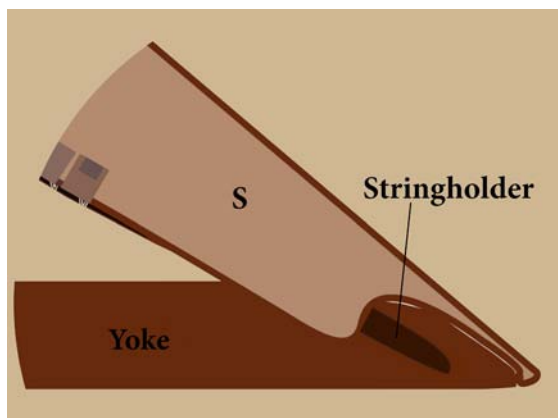


Plate VI 7a. The sound box-yoke junction (drawing to scale).

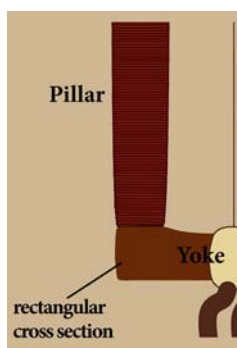


Plate VI 7b. The pillar-yoke junction (drawing to scale).

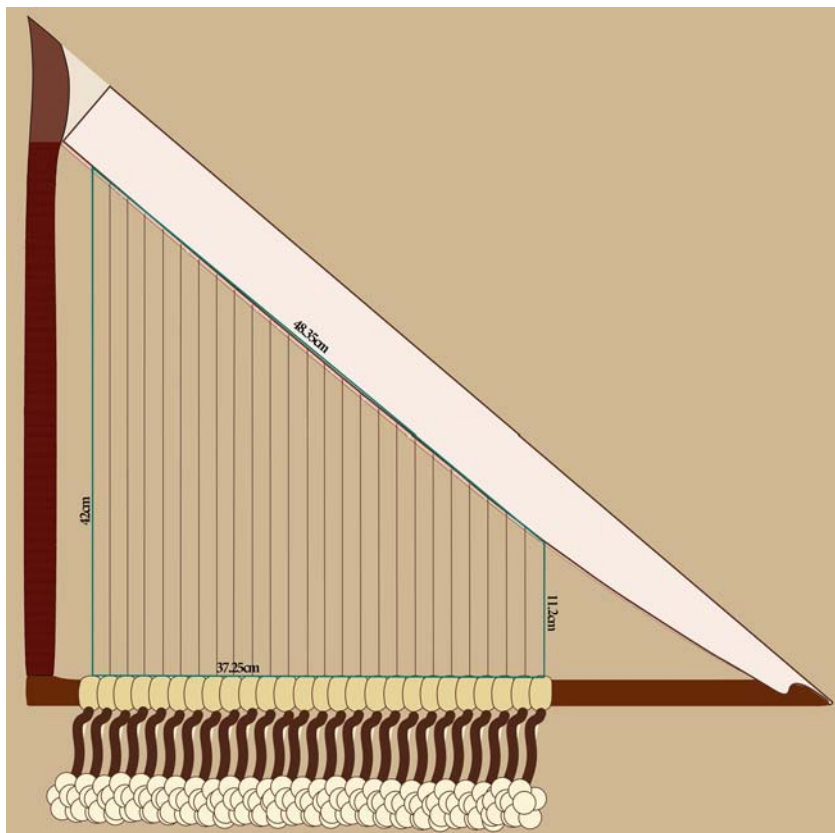


Plate VI 7c. *Trigōnon* restored (drawing to scale).



Plate VI 8a. Daphnē *Trigōnon* replica: wooden frame with string holder in position.



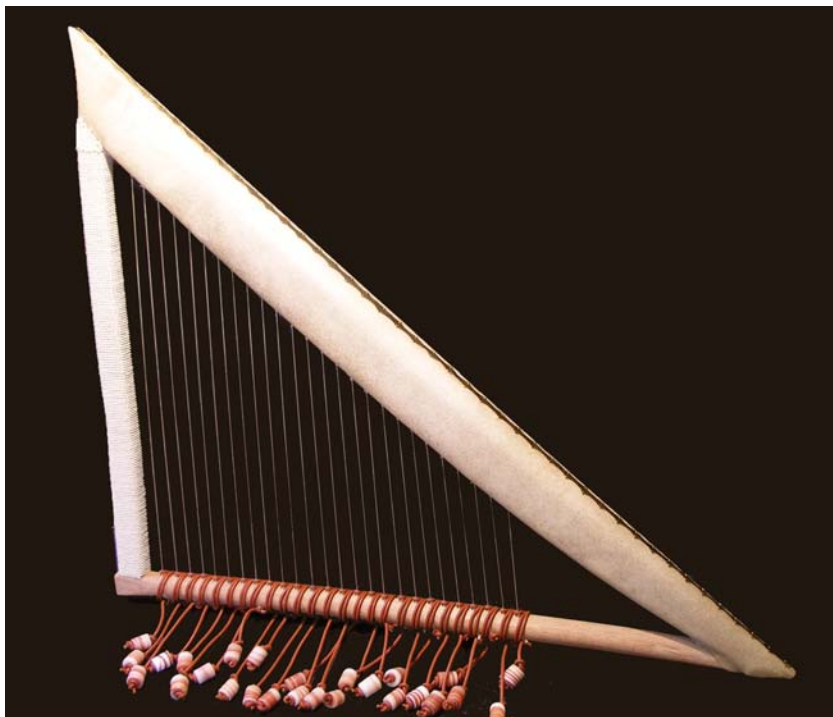


Plate VI 8b. Daphnē *Trigōnon* replica: overall view.

# Aulos and Harp: Questions of Pitch and Tonality

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## Abstract

This study addresses the question of pitches and pitch structures that may have been played on the excavated instruments, assessing string lengths and their implications as well as searching for a plausible effective length for the aulos including its reed, based on computer-modelling the behaviour of the oscillating air column. The results are discussed in the context of our present knowledge about pitch ranges that were typically used in ancient music.

Lo studio esamina il problema delle altezze e delle strutture di altezze che si sarebbero potute ottenere dagli strumenti ritrovati negli scavi. Per far ciò si determinano le lunghezze delle corde e le loro conseguenze sulle altezze; allo stesso modo, si cerca di stabilire la lunghezza effettiva dell'*aulos*, inclusa l'imboccatura, basandosi su un modello computerizzato del comportamento della colonna d'aria vibrante. I risultati sono analizzati alla luce delle attuali conoscenze sui campi di altezze che erano tipicamente impiegati nella musica antica.

## Keywords

music archaeology, ancient Greek music, aulos, harp

## 1. The Aulos

Greek aulos finds so far can be classified according to various criteria: material, shape, bore diameter, number and placement of finger holes. The various pitches that an instrument can produce are primarily determined by the last, while the diameter of the bore (together with the reed's flexibility and aperture) mainly affects the volume, the shape is mostly a matter of fashion (though it bears on the manner of fixing the reed to the tube), and the material has just a little influence on the timbre. Therefore, it is the finger holes that concern us here above all.

As to their general layout, I would like to introduce three basic models of finger hole spacing that are of importance for the study of the ancient aulos. One displays obvious irregularities which leave no doubt about the intentional distinction between intervallic steps of different size on part of the makers. Of this kind are the sophisticated instruments of the Roman era, which combine several musical keys in a highly chromatic finger hole pattern, clearly based on the notion of tones and semitones.<sup>1</sup> Two pairs of wooden pipes from Hellenistic Egypt also belong here. On the Louvre aulos, the distinction between steps of tones and semitones is obvious at first glance.<sup>2</sup> On the smaller Berlin aulos, the same design is intended; however, especially in the high range the spacing between the holes had to be smoothed out a little, since otherwise the holes bounding a semitone would lie too close together: fingers always occupy some minimal breadth.<sup>3</sup> All these instruments belong to a tonal paradigm based on a tuning in fifths and fourths, which they share with string instruments: they are basically diatonic, in the strict sense of the word, with an extension toward semitone-chromatic in the mechanism-equipped pipes.

A different approach is evident in most of the simple early instruments, which usually survive only when made of bone. Here the distances between the finger holes are still dissimilar enough to warrant the assumption of intentional variation, though the differences are not large enough to produce the tone-semitone dichotomy. Contrary to strictly diatonic pipes, where fewer smaller distances are interspersed within a majority of larger distances, here the larger steps are usually the minority. Such a spacing gives a particularly natural fingering (real semitones are almost impossible to handle on a pipe that plays within the lower part of the main vocal octave, where total finger spans of more than twelve centimetres are required), so it is not surprising that similar layouts are still used on bagpipe chanters from various regions. I have associated auloi of that type with the origins of Greek 'enharmonic' music, based on a specific form of 'diatonic'.<sup>4</sup>

Thirdly, finger holes may be spaced evenly. In some sense, this is the most primitive approach (save random spacing), since the construction of such instruments seems governed not so much by musical principles as by the

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<sup>1</sup> Best studied are some pipes from Pompeii; cf. Hagel 2008a and Hagel 2012 with literature. Note that such instruments form the only ancient class where finger holes were also intentionally dissimilar in diameter (i.e. planned to be so by design, as opposed to secondary adjustments, made to correct a particular pitch).

<sup>2</sup> Louvre nr. 10962; cf. Bélis 1984; Hagel 2004.

<sup>3</sup> Berlin Egyptian Museum nr. 12461 and 12462; cf. Hagel 2010.

<sup>4</sup> Hagel 2008b; Hagel 2009, 393–429.

makers' convenience. Nevertheless equidistant finger holes are widely spread in the ethnomusicological record. A hypothesis that was brought forward in 1939 by Kathleen Schlesinger, basing a theory of ancient modes on equidistant finger holes, was rightly rejected both for its disregard for the archaeological evidence and its misinterpretation of texts.<sup>5</sup> In fact, while the principle of equidistance is clearly present on double pipes from Pharaonic Egypt, so far it has not been found on any Greek aulos.

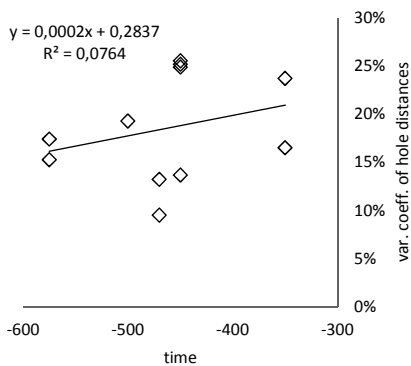
The Daphne pipe is the first certain exception. In order to get a better idea of its unique status, we need a proper measurement for the concept of 'deviation from absolute equidistance'. Quite naturally this is given by the variation coefficient of distances between neighbouring holes within a pipe, which is independent of the pipe's size, overall pitch, or the number of holes present. The values decrease with increasing uniformity of spacing, approaching zero at absolute equidistance. As shown in Figure 1a, the values for all archaic and classical auloi which are at least roughly dated vary from about 10% to 25%.<sup>6</sup> A linear regression appears to indicate a very slight tendency towards more markedly different distances within the two centuries in question; but it explains only a very small part of the data: in general, we face a stable situation.<sup>7</sup>

In Figure 1b, our new find is added to the picture, based on the measurements given by Stelios Psaroudakēs above. Its tiny variation coefficient of only 3.8% makes it a clear outlier and a first possible member of an equidistant class of auloi. The deviation from absolute equidistance is small enough that one might account for it by possible distortions due to the warping of the wood. On the other hand, it can just as well be explained as resulting during production. The four extant distances range between 23mm and 25mm. If we assume, *ex hypothesi*, that the positions of the internal holes were determined by first halving the distance between the outermost two, and subsequently the resulting halves, we obtain predicted positions that agree with the measurements to within one millimetre—certainly reasonably accurate for an instrument of this kind. On balance, the data therefore suggests intentional equidistance, especially when we take into account that the thumb hole sits on the opposite side of the instrument: therefore its location exactly between its neighbours

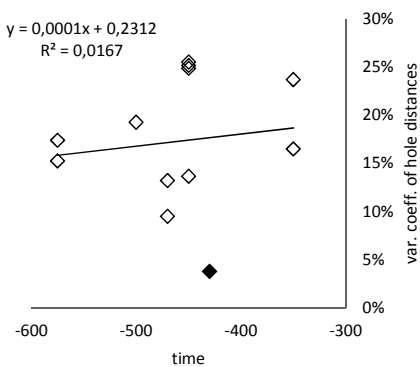
<sup>5</sup> Schlesinger 1939; cf. Winnington-Ingram 1939a; 1939b; 1958, 32f; West 1992, 96f.

<sup>6</sup> For literature and data on early auloi cf. Psaroudakēs 2002.

<sup>7</sup> Nevertheless, the regression line predicts the later evidence surprisingly well: compare the predicted 28% for the turn of the Christian era with an actual 30% obtained as an average from those instruments for which reliable measurements exist and which date, with different degrees of certainty, from the earlier Roman Imperial period: the Louvre aulos, the Berlin aulos and Pompeii pipes 2 and 3 (National Archaeological Museum Naples nrs. 76892 and 76893).



(a) without the Daphne pipe



(b) including the Daphne pipe

Figure 1. Variation coefficients of inter-hole spacing in roughly datable auloi from the archaic and classical periods.



could not be established by eyesight but required painstakingly transferring measurements from one side to the other. Similarly, the concomitant interruption of the series of holes on the upper side ensures that the observed equidistance was not motivated by visual aesthetics, as it was not discernible except between the lowest holes.

Now similar physical distances of finger holes on a pipe result in dissimilar steps between the notes they play: the intervals become progressively wider with increasing pitch. Of the scales described by ancient musical writers, none exhibits such characteristics; to play the scales of theory on such a pipe, the performer would have to adjust many pitches by half-stopping finger holes (cross fingering does not work on instruments where the diameter of the finger holes is not much smaller than that of the main bore) or changing the position of the lips on the double reed.

Apparently ancient music theory had already been analysing tonal structures by basic units spanning a fourth (*syllabá*, *tetrákhordon*) in the fifth century.<sup>8</sup> Fifths and fourths had been prominent in the tuning of stringed instruments from time immemorial. It is possible that this paradigm had superimposed itself upon traditional pipe music based on largely equidistant instrument designs—though also incorporating fifths and fourths at certain points—so as to produce, at first, those slightly modified auloi that feature so prominently in the archaeological record from the archaic and classical periods, and later, diatonic and modulating chromatic instruments. If so, the Daphne aulos would belong to a particularly ‘primitive’, perhaps highly traditional, type of music.

Is it possible to detect any traces of such a stage—or style—influencing early music theory? The only potential link I can see is the structure of the ‘Syntonolydian’ reported by Aristides Quintilianus among other ancient *harmoníai*, whose top interval is a minor third, and therefore just a little larger than a tone.<sup>9</sup> Aristides’ account is strictly enharmonic in that it talks about quartertones and omits the diatonic alternative within the tetrachord. However, any aulos designed to play such a scale would have been equipped with a diatonic finger hole as well, since the enharmonic ditone is too large to be played by adjacent fingers, so that there is always a finger, and therefore a diatonic hole, in between.<sup>10</sup> If the quartertones are furthermore translated into 3/8 of a tone, as seems to have been typical for more archaic ‘enharmonic’ music,<sup>11</sup>

<sup>8</sup> Cf. Hagel forthcoming.

<sup>9</sup> Aristid. Quint. 1.7, pp. 12–13 Winnington-Ingram.

<sup>10</sup> Hagel 2009, 393.

<sup>11</sup> Cf. n. 4.

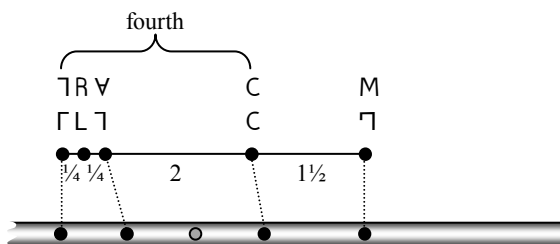


Figure 2. Aristides' 'Syntonolydian' *harmonía* and a hypothetical almost-equidistant aulos.

a physical aulos layout results as shown in Figure 2. Here the lower part of the scale is indeed equidistant. The distance to the highest finger hole, however, is inevitably larger than the rest, if the respective interval is to appear as a third rather than a tone.<sup>12</sup> Evidently not even the most 'equidistant' scale known from antiquity can account for the design of the Daphne aulos, and so it seems we have to accept this instrument as belonging to a musical undercurrent that had escaped theoretical analysis.

An assessment of the notes it played must therefore rely on very basic assumptions—mainly, that some consonant intervals were present, and secondarily, that the pipe was not entirely alien to the heptatonic paradigm with occasional pentatonic elements to which all the evidence testifies.<sup>13</sup> In addition, of course, any hypothesis must be based on a plausible effective length of the reed mouthpiece. For other instruments, this turned out to be something between 3.2cm and 4.2cm, although it must be emphasised that so far no certain results have been obtained for auloi of the archaic type.<sup>14</sup>

Unfortunately, the question of a plausible reed cannot be separated from that of the total length of the pipe, which in the present case is not established beyond doubt: above all, the lower part of the bulb-plus-insert section, where it connected to the tube, is damaged to a degree that precludes directly assessing its original length. Assuming that we have pretty much all of it, a reed

<sup>12</sup> In theory, it would be possible to obtain a highest interval of 330 cents on the Daphne aulos, if the fourth below it comprises only two instead of three further holes. But this would require an impossibly short reed of a mere 1.25cm even on the shortest possible reconstruction of the pipe; besides, the 'enharmonic *pyknón*' at the bottom of the scale, theoretically about 100-150 cents, would have to be realised on a finger hole lying 230 cents above the lower one. All calculations rely on the software described in Hagel 2004.

<sup>13</sup> On heptatony cf. Franklin 2002; 2005; for discussion of pentatonic, Hagel 2009, 435-41.

<sup>14</sup> Cf. Hagel 2004; 2010; 2012.

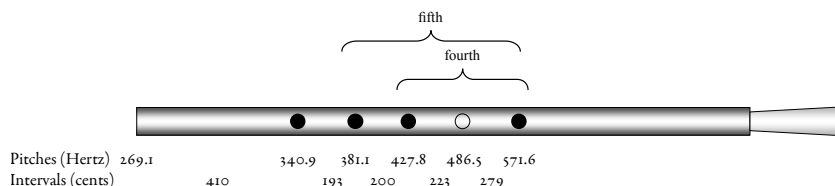


Figure 3. The Daphne aulos with minimal length and a reed of 3.9cm.

extending an additional 3.9cm gives the most plausible scale (cf. Figure 3). It can be described as a series of three tones of different sizes increasing with pitch (very close to a major, a minor and a septimal tone of 182, 204 and 231 cents, respectively), topped by something like a very minor third (close to a septimal third of 267 cents), a combination which sports a pure fourth and a pure fifth down from the highest note.<sup>15</sup> Since these extend only to the next but one and two holes, the upper part would clearly be pentatonic in design (not excluding the production of one or more additional notes by half-stopping, of course), while the three tones in a row in the lower part would form part of a heptatonic scale. One may compare the similar mixture of a lower heptatonic and a higher pentatonic range as attested for the fifth century lyre in Philolaus.<sup>16</sup> The pipe's pitch would reach from a high *D*<sub>5</sub> down to *F*<sub>4</sub> for the lowest extant finger hole and *C*<sub>4</sub> for the entire pipe, all nicely suited to accompany a singer's most comfortable range, which was also that of standard lyres.<sup>17</sup>

It is not very likely that a pipe of this kind would have participated in the kind of music for which the ancient notation system had been devised; and even if it did, we would rather expect it to have used its simplest form and not the modulating approach which implied a sort of fixed pitch.<sup>18</sup> In any case, I can see only one plausible attribution of notes to finger holes, which would

<sup>15</sup> As usual, I have tested the predicted pitches on a model I have built from plastic pipe of suitable dimensions (8 mm internal diameter, walls of 2mm and a reed insert manufactured so that the internal wall of the reed continues the main bore). After adjusting the reed to the general range, the replica easily plays in perfect unison with the calculated pitches as sounded by the computer. Getting purely objective measurements is tricky, because players tends to adjust the pitches to their musical expectations. However, a single (first) recording of a double scale ascending/descending yielded pitches whose respective averages range within 30 cents of the predicted values (in ascending order, -3, +3, +26, +30, +16, +27 cents, showing that during the experiment the embouchure was taken just slightly too high).

<sup>16</sup> Fr. 6a; cf. West 1992, 219f; Hagel 2009, 112–15; 435–41.

<sup>17</sup> Cf. Hagel 2009, 68–95.

<sup>18</sup> Cf. Hagel 2009, 292, 336f, 341f, 445.

equate the lowest extant hole with ‘*hyperypáte*’ ΦF, followed by CC, OK, ΚΔ and ΖC, structurally to be transcribed as  $D-e-f\#-g\#-b$ , and putting the pipe about a semitone above the conventional pitch later associated with these signs.

Assuming that the present interpretation in terms of consonances is correct and that these consonances were intended by the makers, and facing the fact that basic interval mathematics was not only known at the time in question but became explicitly associated with aulos production,<sup>19</sup> we must finally wonder whether the observed pipe design is based on any kind of mathematical reasoning. Any such hypothesis necessarily presupposes some relationship between the placement of the finger holes and other significant measurements, notably the top and the end of the pipe, with or without a reed attached. Unfortunately neither the length of the pipe without its reed is established, nor the position of the reed tip, both because our scale is hypothetical and because a reed’s physical length may differ from its effective acoustical length. Therefore we must start from the end of the pipe in relation to the finger holes. It turns out that the distance from the end to the lowest extant finger hole measures just about another three of the units established by the fairly constant finger-hole spacing. In detail, if we optimally assume this unit to have been 23.71mm, none of the observed distances is off by more than 1.3mm (cf. Table 1).

Table 1. Observed acoustically important distances as multiples of a common unit.

	Distance	= 23.71 mm ×	Deviation from 23.71 mm or its nearest multiple
I–T	24.5 mm	1.0331	0.79 mm
T–II	23.5 mm	0.9910	–0.21 mm
II–III	23.0 mm	0.9699	–0.71 mm
III–IV	25.0 mm	1.0542	1.29 mm
IV–exit	70.0 mm	2.9518	–1.14 mm

<sup>19</sup> Cf. [Aristot.], *Probl.* 19.23: ἔτι ἐν τοῖς αὐλοῖς τῷ διπλασίῳ διαστήματι λαμβάνεται τὸ διὰ πασῶν, καὶ οἱ αὐλοτρῦπαι οὕτω λαμβάνουσιν “again, in the auloi it is also the duple ratio by which the octave is obtained, and the aulos-makers obtain it in this way.”

The same unit might arguably govern the distance to the tip of the reed: from the finger holes upwards, six additional units take us to a point just 2.19mm beyond the calculated optimal effective length (which is a purely theoretical figure from which actual reeds would differ by different amounts).<sup>20</sup> But is it conceivable that instrument makers would have taken into account an actual reed, given the fact that a reed would have been supplied only later and that reeds of similar acoustical properties as regards pitch production may vary in length? More importantly, it would be desirable if the actual instrument's top was also in line with the hypothetical unit. To achieve this for a unit of 23.71mm, however, we would have to assume that 18mm are lost from the visible part of the bulb. Although this would bring the total to a very nice number of twelve, it seems too much—and it would also detract too much from our assumed reed length, leaving only about 2cm of reed protruding from the insert. In contrast, everything works out satisfactorily if we assume that the finger holes were spaced by not one but two of the actual 'units', which would therefore amount to 11.86mm. Under this assumption, the missing part from the bulb section, from its broken lower end to the point where it entered the tube, is predicted to have measured 5.94mm.

How reasonable is this value? The overall shape of the bulb suggests that it was of the early type, whose lower part, as well as the socket in the main tube that received it, is best preserved on the Poseidonia aulos:<sup>21</sup> while from the bulb upwards it flares slightly to receive the reed, on the other side it tapers down to a cylinder whose diameter is smaller than that of the main tube, so that it can go into a socket there. Consequently the walls of the bulb section are very thin both above the bulb (because the outer diameter of the reed is thicker than the bore) and below it, which explains why almost all extant examples are broken at least at one end. As shown in Figure 4, the extant curvatures of the Poseidonia bulbs and the Daphne bulb are identical in form (though not in size; the Poseidonia aulos was a much larger instrument, obviously for male hands); a perhaps even closer match is the bulb from Ialyssos, since its upper end is partially preserved as well. By overlaying them graphically, we can obtain a rough idea about the extent of the missing cylindrical part below the Daphne bulb: an exact structural correlation would imply something around

<sup>20</sup> The point of reference is an ideal grid that minimises the sum of errors for the finger holes and the tube end; this grid starts at 0.39mm above the tube end.

<sup>21</sup> National Archaeological Museum Paestum, inv. 23068, dated around 500 BCE; cf. Bellia 2012, 98f (note that the photograph given there and on the cover shows most of the parts turned the wrong way around). Once more I wish to express my warmest thanks to Paul and Barbara Reichlin-Moser for sharing their measurements and photographs, together with excellent drawings by Verena Pavoni, obtained during a research project funded by the Stavros Niarchos Foundation.

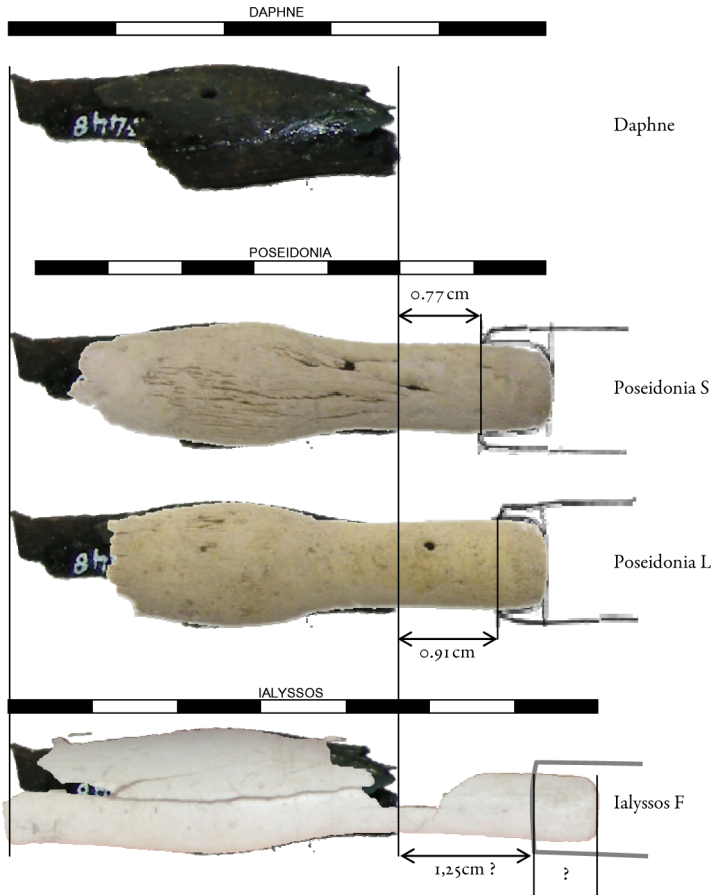


Figure 4. The Daphne bulb overlaid with the Poseidonia bulbs and the Ialysos F bulb (the former at 68% of the Daphne bulb's scale, the latter at 79%). Poseidonia aulos photos and drawings © P.J. & B. Reichlin-Moser/C. Steinmann; Ialysos photo: S. Psaroudakēs.

7.5—9mm, starting from the Poseidonia instrument. The Ialysos bulb suggests a few millimetres more; we cannot know exactly, however, because the depth of the receiving socket is unknown. Of course these figures rely on a number of unproven, though not unlikely assumptions.<sup>22</sup> In any case, they should suffice

<sup>22</sup> Note that Stelios Psaroudakēs, in his evaluation above, assumes a substantially larger value. When extrapolating possible lengths from comparison with other finds, we seem to disagree



to demonstrate that the predicted amount of 6mm is quite realistic and certainly in very good agreement with our general knowledge of the construction of early auloi.

With a bulb of that size, the holes would have been placed at 12, 14, 16, 18 and 20 ‘units’ from the assumed mouthpiece end, and the pipe end at 26 (cf. Table 2); the reed required for the scale discussed above would shrink to about 3.3 cm, a very reasonable value. The predicted intervals of a fifth and a fourth are nicely expressed by the ratios of 18:12 and 16:12 (if counting from the reed tip, as is physically necessary); this, at least, may be intended.<sup>23</sup> It is really a pity that we cannot determine whether there was an additional ‘vent’ hole, and if so, whether it would fit in the observed pattern.<sup>24</sup> As far as we can see, at any rate, Kathleen Schlesinger would have been happy with the Daphne pipe.

Table 2. Observed distances from top as multiples of a common unit.

	Distance from exit	Units from		Deviation from nearest integer
		Top	Presumed reed tip	
reed tip	(305.7 mm)	–3	0	(–2.19 mm)
top	230.0 mm	0	3	0.02 mm
I	166.0 mm	9	12	0.39 mm
T	141.5 mm	11	14	–0.39 mm
II	118.0 mm	13	16	–0.18 mm
III	95.0 mm	15	18	0.54 mm
IV	70.0 mm	17	20	–0.75 mm
exit	0.0 mm	23	26	0.39 mm

about what to address as the ‘bulbous section’: while he takes the full length of the Daphne ‘bulb + lip’ as corresponding to bulbs like those from Poseidonia, I argue from aligning the shapes as closely as possible, therefore excluding the Daphne ‘lip’ from the comparison and concluding that a in smaller instrument these parts were also smaller—as well as leaving open the possibility that similar ‘lips’ have perished from the Poseidonia bulbs.

<sup>23</sup> Curiously, an equidistant spacing of finger holes brings about a better agreement between distance ratios and actual intervals (because it ensures similar offsets by which the vibrating air column extends below the individual holes, except for the lowest hole).

<sup>24</sup> Generally the assumption of another hole at the same distance is in line with data from other early auloi: by extrapolating the respective distance from the higher Poseidonia pipe, for instance, one obtains results between 24.6 mm (scaling according to the average of the next two higher distances) and 26.3 mm (according to the average of all hole distances), quite close to the deduced (double) unit of 23.71 mm.

## 2. The Harp

Material remains of stringed instruments do not yield their original pitches as straightforwardly as wind instruments may do. Harps and lyres, due to the absence of a finger board with frets or potential use-wear marks, do not even hold a direct clue about the intervals they may have played. All we can do in such a case is to establish a likely pitch range and try to integrate the given number of strings within it, on the lines of a plausible interpretation within the context of our general knowledge of ancient music. In principle, the best way there leads through extended sets of experiments, carried out with no regard for snapping strings and collapsing frames. However, this would require chemically untreated gut strings as are hardly available nowadays, and also a more detailed knowledge of the harp's mechanical structure. At least as a first step, therefore, resorting to cautious calculation has its advantages over a merely experimental approach.

Our natural starting point is to establish, as exactly as possible, the vibrating lengths of the harp's strings. As Chrēstos Terzēs has demonstrated above, the surviving arm was not the yoke but the pillar. It is therefore the smaller angle that governs the increase in string length along the instrument, which favours smoother scales, with smaller intervals on average.

The string holder was doubtless fixed as close to the pillar as possible, in order to make the most of the instrument's size: any gap between string holder and pillar would merely compromise the stability of the structure without any real extra gain. Also, the distance between the string holder's end and the hole for the first string is just large enough to make sure that the fingers are not encumbered by the pillar when plucking this string; and finally, the string holder, if placed in this way (and assuming no substantial loss at its lower end), neatly coincides with the straight part of the sound box, stopping just short of the point where the latter starts to curve when tapering towards its meeting point with the lost yoke.

A priori one would assume that the strings ran vertically, parallel to the pillar and to each other, meeting the yoke at a right angle. This is most practical for playing, since the direction of plucking is identical with that of arm movement. Furthermore, it minimises the lateral force that the strings exercise on the string holder, drawing it downwards along the sound box. It also accords best with the iconographical evidence—at least with those images that make musical sense at all. The distance between the strings set up in this way measures 14.8 mm, which is slightly above that typical on modern harps with gut strings. Theoretically one might obtain longer vibrating lengths by fastening

the strings closer to the meeting point of sound box and yoke. With such a tilted stringing, however, the placement of tuning rings would probably be less stable, plucking would be less convenient, and above all, the spacing between the strings would decrease significantly. In any case, a slant that reduces the spacing to a just acceptable 11mm (anything lower than that requires fingernail plucking and therefore metal strings) would increase string lengths by no more than a hardly significant third of a tone ( $15.5^\circ \rightarrow 64$  cents).

Therefore we can reconstruct, with near certainty, the length of the longest string, measured inside the frame, as about 42.3cm, and that of the shortest string as about 11.2cm. On Chrēstos Terzēs' reconstruction, however, the actual vibrating lengths are reduced by about 10mm, due to the tuning rings as well as the method of fastening the string to the sound box. But with a different type of tuning collars the strings might as well go around the collar or arrive at the yoke next to it; in this case, the point of contact would lie close to the middle of the yoke and the vibrating length would instead be *increased* by about half its diameter (another unknown variable), an amount that would almost certainly overcompensate the loss at the other end. The following calculations are therefore based on the raw distances within the frame as a reasonable mean; afterwards I will return to the error possibly involved.

Fortunately, there is more than string lengths to start from. Notably, the holes in the string holder are all of similar diameter, indicating that on this instrument a decrease in pitch was achieved only by increasing length (and adjustment of tension), but not also by increasing the thickness of the string, as in the case of lyres. This is confirmed by a passage in the *Problems*, which makes string length the single determining factor in harps of this type:

ἔτι [οἱ] ἐν τοῖς τριγώνοις ψαλτηρίοις τῆς ἴσης ἐπιτάσεως γινομένης συμφωνοῦσι διὰ πασάν, ἢ μὲν διπλασία οὖσα, ἢ δὲ ἡμίσεια τῷ μήκει. ([Aristot.], *Probl.* 19.23)

Furthermore, in the triangular harps, at equal tension, they sound an octave concord, if one is of double, the other of half length.

This observation rules out the possibility that the strings are of dissimilar diameter: a string that is not only half as long but also thinner than another can hardly be meant to sound merely an octave higher, and definitely not “at equal tension”; rather, it would have to be slackened, with detrimental consequences to its sound—or the longer one overly tightened.

On the other hand, the quoted passage cannot be taken to imply that on triangular harps pitch relations were governed by length relations wholesale.

That much is excluded by the triangular shape, whose arithmetical progression is at odds with the geometrical progression demanded by the scales of ancient music (and most musics of history). Certainly it was true, in reasonable approximation, for some specific pair of strings—perhaps even for one of particular musical importance; but then it would not have been equally true for any other pair. This has important consequences if one wants to have the same notes in more than one octave—which is once more the most natural assumption. Starting from an ‘ideal’ pair as described in the *Problems*, the further away from it another note pair comes to lie, the more a difference in tension would have to substitute for the mismatch in length ratio. There is, however, a limited range of musically available tensions between the extremes of breaking and exceedingly slackening a string. Therefore the triangular shape as such considerably restricts possible tunings—a fact that may have been deplored by musicians, eventually leading to more refined harp shapes in the course of the centuries, but which is more than welcome for our investigation.

The musical characteristics of gut strings depend not only on their diameter but also on the amount of twist:<sup>25</sup> strings of higher twist may continue to give acceptable results at lower pitch, though they are less tolerant to tension. Since all strings apparently were of similar diameter, however, it is unlikely that they were of different make otherwise. As we will see shortly, any further extension of the general pitch range is altogether improbable anyway; therefore, we may safely assume a low twist ratio of about 6, and therefore higher tension resistance and durability. Calculating a lowest acceptable pitch for a given string furthermore requires making certain assumptions regarding the manner of plucking and the maximally accepted pitch slide while the string sounds. In the following I take the latter to be an eighth of a tone instead of the sixth of a tone used by Abbott/Segerman (1974) 64, since the presence of microtonal shading in ancient Greek music arguably calls for slightly higher precision. Regarding plucking action, precaution has to be taken not to wrongly extrapolate ‘normal’ values to the shortest strings, which pose special restrictions both to the position of the hand (it must avoid touching the frame) and to the way of plucking (equal force results in a smaller displacement, while a similar displacement might break them). Therefore, I assume the strings to be plucked somewhere around a third of their length, but no closer to the frame than 5cm, and by pulling them sideward by maximally about 4mm, but no more than 2% of their respective lengths. Finally, it is clear that a string must not be tightened up to breaking pitch. The safety margin might have been a little

<sup>25</sup> Cf. Abbott/Segerman (1974) 51.

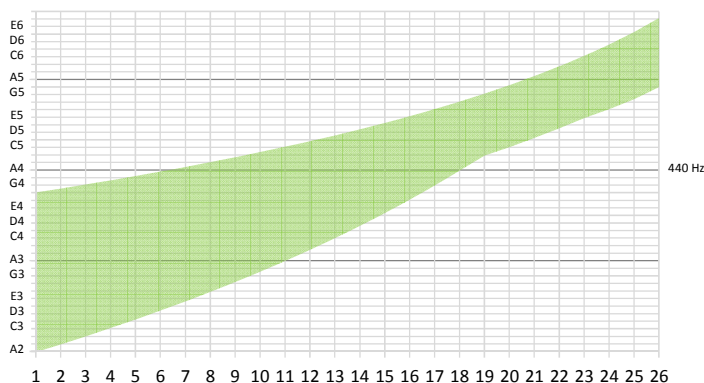


Figure 5. Pitch ranges for each string of the Daphne harp. The bend in the lower limit is the point where the limitation on plucking strength on shorter strings takes over.

lower than on lyres, where violent plectrum action was much more likely to break a string; on the other hand, regularly replacing strings would be considerably more costly on a harp of twenty-six than on a lyre of a mere seven to eleven. Accordingly I have settled on the customarily recommended minor third below breaking.

Starting from the outlined assumptions, we obtain approximate usable pitches for each string on the Daphne harp as shown in Figure 5. Evidently a range of almost four octaves might be possible. A continuous non-modulating heptatonic tuning might therefore be feasible, though only with significantly increasing tension from about 6N for the lowest to 60N for the highest string (assuming strings of 0.8mm diameter: cf. Figure 6a; the total tension would amount to c. 760N). Such a tuning, however, meets a more serious objection than string tensions: Aristoxenus expressly says that no instrument exceeds a range of two octaves and a fifth.<sup>26</sup> Consequently our harp must have had more than 7 strings per octave and consequently played in several genera or keys—just as triangular harps are characterised in Plato's *Republic*.<sup>27</sup>

<sup>26</sup> Aristox. *Harm.* 1.20, p. 26.2–8 Da Rios.

<sup>27</sup> Plato *Rep.* 399cd: τριγώνων ἄρα καὶ πεκτίδων καὶ πάντων ὀργάνων ὅσα πολύχορδα καὶ πολυαρμόνια... “*trigona* and *pektides* and all the instruments that have many notes and many *harmoniai*...”

Was it perhaps fully chromatic? At any rate, chromatic tunings make for a much smoother distribution of tension. A very low variant, from  $G_3$  to  $G_5$  exerts a tension of c. 700N; a very high one, from  $C_4\#$  to  $C_6\#$ , 1380N (Figure 6b)—but can we expect the frame to have resisted such forces? The strongest counter-argument once more comes from music-historical considerations: given the fact that only Aristoxenus is credited with having devised a full modulating diagram, a fully chromatic harp at the period in question might seem anachronistic. True enough, the concept of ‘twelve notes’ or ‘strings’ features largely in the Pherecrates fragment, referring back to as early as Melanippides;<sup>28</sup> but it is far from clear whether this would be related to the twelve semitones in the octave. And twenty-six notes are just one too many for two chromatic octaves anyway.

Whatever hypothesis we adopt, it is reasonable to assume a full repetition of notes at the octave: the concept of  $\mu\alpha\gamma\alpha\delta\iota\zeta\epsilon\iota\nu$ , music-making in octave parallels, is associated with instruments of the harp kind,<sup>29</sup> and doubtless this option was one of these instruments’ major benefits. This granted, any divergence in tonal material between different octaves would have unduly inconvenienced the task of the player when performing parallel movements. For this general reason, I do not discuss the theoretical options that this would admit.

Possibly the harp’s dimensions provide an additional clue: its restored maximal string length of 42.3cm is remarkably close to the inferred vibrating length of lyre strings of c. 43.4cm ( $\sigma=5.1\text{cm}$ ).<sup>30</sup> Was the range of the harp somehow related to that of the lyre, so that the same songs could be comfortably accompanied on both? If so, a chromatic interpretation would once more not do: if the lowest string of the harp is tuned in unison with the lyre *hypátē* or *hyperypátē*, the highest strings will be too short (Figure 6c); and if the whole structure is transposed an octave higher, so that the lowest note of the harp corresponds to the highest range of the lyre, the required tensions are much too high (Figure 6d). Any actual parallel in range to the lyre therefore also calls for a less than fully chromatic solution.

Which notes would we expect to find in a moderately modulating tuning? From both the development of ancient theory and the musical fragments, it is not very difficult to come up with an answer: the prominent positions of early chromatisation were, on the one hand, *synēmménōn* modulation (providing, so

<sup>28</sup> Ps.-Plut. *Mus.* 1141d6–f11 = Pherecrates *fr.* 145 Kock.

<sup>29</sup> Cf. Barker 1988; West 1992, 72f.

<sup>30</sup> Hagel 2009, 88f.



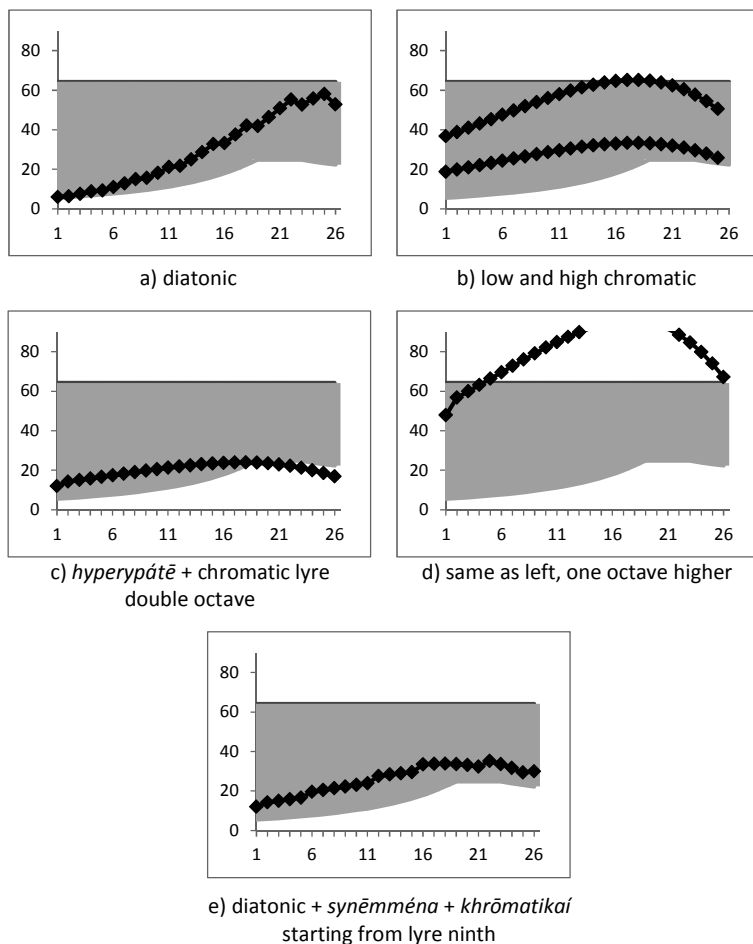


Figure 6. Tensile forces (in N) for individual strings (of 0.8mm diameter) and various hypothetical tunings.

The grey area indicates the usable range (cf. Figure 5), bounded upwards at a minor third below breaking.

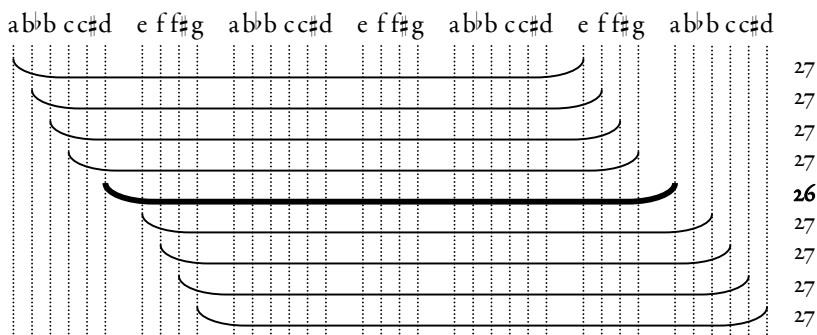


Figure 7. Note numbers for ‘moderately modulating’ double octaves plus fifth.

to speak, *b* flat as an alternative to *b*), and on the other, *chrōmatikaí* (providing *f* sharp and *c* sharp which modulate in the other direction, but also constitute ‘chromatic’ tetrachords as a variant to diatonic).<sup>31</sup> It is exactly such a system that we find described in theoretical sources such as Thrasyllus’ and Didymus’ divisions of the canon,<sup>32</sup> but also in practical use in the Koilē transverse flute,<sup>33</sup> and probably on the eleven-stringed lyre.<sup>34</sup> If extended to twenty-six notes, such a scale would cover *about* two octaves and a fifth—in fact, *exactly* this interval when ranging from a structural low *d* to high *a*, as emerges from Figure 7. This establishes a noteworthy coincidence. On the one hand, two octaves and a fifth is just the largest interval Aristoxenus acknowledges as being encompassed within a single instrument, and it is hard to see what instrument this would be if not a harp. On the other hand, the lowest note on the lyre, as far as we know, *hypērypātē*, is best described—and transcribed—as a structural *d*.<sup>35</sup> This in turn chimes in with our observation that our harp’s dimensions allow for a lower range similar to that of the lyre.

<sup>31</sup> Enharmonic *parypatoeidē*, in contrast, were probably not used on stringed instruments (cf. the disagreement between musical notation and Archytas on the one hand and *harmonikoí*-style theory on the other as to which enharmonic and non-enharmonic notes ought to be regarded as identical, a discrepancy that could not possibly have arisen if the relations could have been read from a stringed instrument).

<sup>32</sup> Cf. Hagel 2009, 167f; 187–94.

<sup>33</sup> Psaroudakēs 2012, 534f: two conjunct diatonic/chromatic tetrachords, lacking the highest note, plus two steps of a tone each below; *synēmmēnon* modulation would require an additional hole between the two lowest but one, whose addition was ruled out by fingering possibilities, the *chrōmatikai* being associated with the thumb holes.

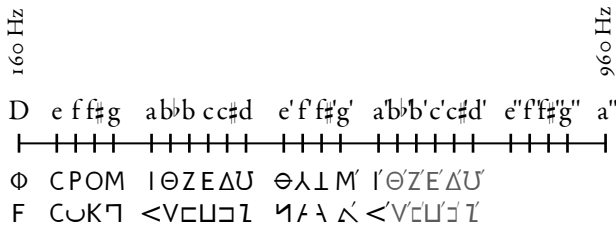
<sup>34</sup> Cf. Gevaert 1881, 260–62; West 1992a, 26–27; Hagel 2009, 283.

<sup>35</sup> Cf. Hagel 2009, 132, 452f.

For these reasons, I think, of all necessarily hypothetical proposals such a ‘moderately modulating’ tuning is by far in best accordance with the evidence. When set on the pitch commonly agreed for ancient music (Figure 6e), it also creates a perfectly fitting pattern of string tensions, which are generally rather low, though rising with the lower boundary of the usable range, in another excellent concordance. In this way, the instrument’s triangular shape is taken advantage of surprisingly well, given the general problems of arithmetically increasing string lengths. The total force exerted by the strings thus amounts to c. 680N, which appears perfectly realistic (the absolute minimum for 0.8mm gut strings would be around 400N, whereas twenty-six such strings at breaking tension exert a maximal force of 2400N).

Now that we have obtained a possible interpretation, we must return to the question whether it would hold for reduced string lengths as well, as are caused by the tuning method used on Chrēstos Terzēs’ reconstruction. Fortunately, when the calculations are based on accordingly altered figures, it turns out that none of the above arguments is affected even by a reduction of full 10mm. However, as Figure 8 shows, the predicted pitches would now be closer to the lowest end of the usable spectrum, while the calculated overall tension drops to c. 615N.

Therefore, I propose the following approximate basic tuning (without excluding the idea of individual adjustments for particular performances):



When tuned in this manner, the Daphne harp could play, at the same pitch, any melody contemporary lyres would play (ΦF—ΘΛ), including their first harmonics.<sup>36</sup> In addition, it was able to duplicate the entire system up to the Lydian *hyperbolaion* tetrachord (ΘΛ—I'<) an octave higher. Its design spared

<sup>36</sup> Cf. Hagel 2009, 32, 129f.

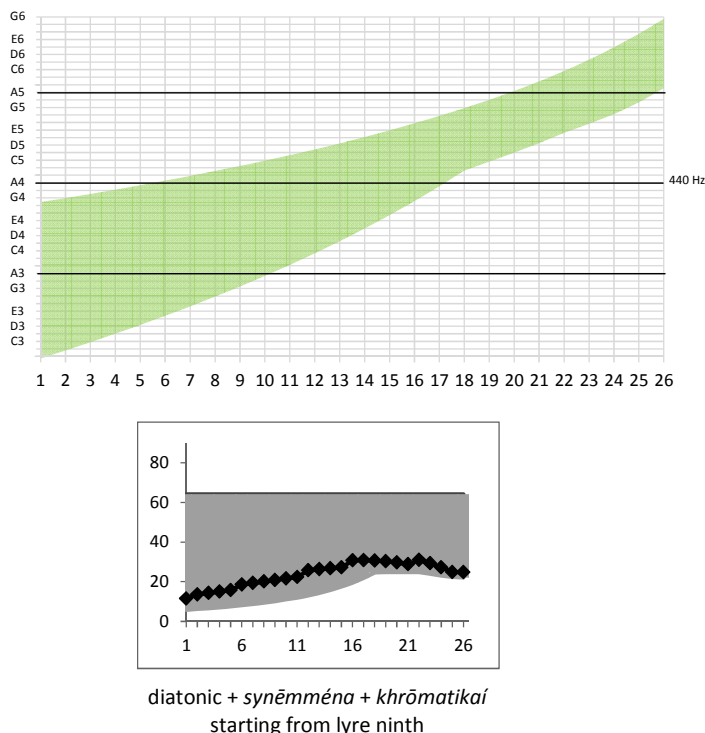


Figure 8. Pitch ranges and proposed tuning with a loss of vibrating length of 10mm for each string due to tuning collars and fastening.

the player the effort of retuning between pieces in different keys, and enabled modulation between several neighbouring keys as well as between diatonic and chromatic,<sup>37</sup> making it the truly polyharmonic—though not panharmonic!—instrument that was not to enter Socrates' ideal state.

<sup>37</sup> In later standard nomenclature, the proposed basic tuning would incorporate: diatonic and chromatic Hypophrygian/Hyperlydian, diatonic and chromatic Lydian, diatonic Hypolydian and Hyperiasian. Regarding the *kithára* tunings reported by Ptolemy, these would be associated with *hypértropa*, *trópoi*, *trítai* and *lýdia/parypátai*, but not *iástia*.

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## Authority as ‘Resultant Voice’: Towards a Stylistic and Musical Anthropology of Effective Speech in Archaic Rome

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(translated from the French by Matthew Duncombe)

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### Abstract

Analysis of a large number of texts from the archaic period of Roman culture shows that the authoritative character of a solemn utterance (a prophecy, the formula uttered by a *praetor*, a religious *praefatio*) was based principally on specific sound patterns. From these utterances' use of parallelisms, phonic echoes and syllabic repetitions there emerged a sort of 'resultant voice', which made their exceptional character immediately apparent. From the perspective of their intended hearers, the sound-construction of these pronouncements had the capacity to arouse what the Romans called *delectatio*: that is, the disposition to believe in the truth and validity of what they were hearing. That the Romans included all these acoustic phenomena within a single perceptual domain is demonstrated by the fact that music, too, had the power to produce *delectatio*—and by the fact that the verb *cano* and its derivatives refer as much to musical as to poetic expression.

L'analisi di numerosi testi provenienti dalla cultura romana arcaica mostra che il carattere autorevole di un enunciato (profezia, formula del pretore, *praefatio* religiosa) si fondava prima di tutto su presupposti di carattere *sonoro*. Il ricorso a parallelismi, rispecchiamenti fonici, iterazioni sillabiche, faceva sì che all'interno di questi enunciati emergesse una sorta di 'voce risultante', capace di manifestare immediatamente il loro carattere eccezionale. Dal punto di vista dei destinatari, la costruzione sonora di questi enunciati era capace di provocare ciò che i Romani definivano *delectatio*: ossia la disposizione a credere nella verità e validità di quanto udivano. Il fatto che anche la musica fosse in grado di produrre *delectatio*—e l'uso del verbo *cano* e derivati tanto per designare l'espressione musicale, quanto quella poetica—mostra come i Romani includessero tutti questi fenomeni sonori in un unico campo di percezione.

### Keywords

authority, sound patterns, voice, *delectatio*, *canere*



"Mi dica Berio, che cos'è la musica?" . . .

Gli risposi che la musica è tutto quello che ascoltiamo

con l'intenzione di ascoltare musica, e che tutto può diventare musica.

Luciano Berio to Roman Jakobson

In a previous study, we were concerned with the verb *fari*, a Roman mode of 'saying' that relates to the sphere of effective speech.<sup>1</sup> In Rome, it is the soothsayer who *fatur*, and destiny—the speech or event delivered by *Iuppiter* or *Parcae*—is called fate. Similarly, the praetor *fatur* when he utters the *tria verba*, namely, *do addico dico*, by which a law is immediately enacted; and anyone who utters a formula for good augury so as to concretely influence the action that he is preparing to undertake *prae-fatur*. In the same way, the priest *prae-fatur* when he recites a precise ritual formula before making an offering and the augur *ef-fatur* when, through his words, he circumscribes a ritual space, creating it at the same time. In sum, *fari* indicates the sphere of effective speech, capable of having an impact on reality. The linguistic act that this verb implies presents some very specific characteristics, especially if examined from a linguistic and anthropological point of view. In fact, one might say that it presupposes the presence not of a single speaker, but two. In other words, *fari* is presented as a speech act in which the speaker who is present (soothsayer, praetor, priest, augur) is supported by a superior 'agency'—a deity, a supernatural force, in all cases a source of *auctoritas*—which allows the message which is delivered to be authoritative and, therefore, to be effective. To borrow the terms used by Erving Goffman, the word *fari* presupposes the presence of an 'animator' supported by a 'principal'. 'This is what Jupiter told (*fatus est*) me', affirms the soothsayer Marcius concluding his prophecy about the Battle of Cannae. Even before the soothsayer has asserted his prophetic *fari*, Jupiter himself *fatus est*.<sup>2</sup> However, while there is a divine 'agency' behind the *fari* of the augur or priest, the secular voice of the *res publica*, that which invested the voice of the praetor with *auctoritas*, is heard just as powerfully.

<sup>1</sup> Bettini 2008a, 313-75. Similar utterances are concerned with a form of effective speech which in many respects recalls that of the 'masters of truth'—the prophet, the singer and the justice-dispensing king—discussed by Detienne 2006 (= 1965); cf. also Detienne 2005, 92-3.

<sup>2</sup> Goffman 1979, 1-29. Cf. Dubois 1986, quoted by Leavitt 2001, 281-6; Duranti 2007, esp. 87 ff.; *Carmina Marciana* 1, 8 Morel.

## 1. A Stylistic Anthropology

But how, in concrete terms, should we imagine this voice speaking in the manner of *fari*? By what stylistic features must it be characterised so as to be recognised as functioning within that sphere? This question forces us to abandon the problem of *uttering* that we discussed in our previous work, in favour of that of the *utterance*. One could put the question thus: how is an utterance formulated when expressed in the modality of *fari*? From the larger dossier that we have built up, we will select a few examples of utterances that correspond to linguistic acts that the Romans regarded as being specific to *fari*.

But, before addressing that issue, a clarification seems necessary. I am well aware that the authority of an utterance, and hence its efficacy, depends not only on the stylistic form assigned to it but also on at least two other factors: the speaker's identity—his personage, his role—and the context in which the utterance is produced. To remain with Rome, one and the same formula will not have the same value if it is recited by a private citizen, rather than by the praetor while he is officiating;<sup>3</sup> what is more, the praetor's speech will not have the same effect if he delivers it while lying on a couch at a banquet, rather than while sitting on the *sella curulis* high on a *tribunal*.<sup>4</sup> It is equally clear that the lines of a dramatic poet will not produce the same effect when they are declaimed or sung on stage as when they are chanted in a classroom, while a grammarian subjects them to his commentary. Accordingly, if, in the reflections that follow, I focus instead on the *stylistic* form—in the broader sense of that word<sup>5</sup>—which characterises effective utterance in Roman culture, without taking into account the identity or role of the man who produces it or the context in which it is uttered, this choice is determined only by the perspective that I decided to adopt in this particular case.

In Cicero's *De divinatione*, Quintus says that 'our ancestors, because they felt that the *omina* possessed a great effectiveness (*valere*) prefaced (*praefabantur*)

<sup>3</sup> One is reminded of the paradoxical case of the pantomime Paris, who was clad in the *insignia* of a magistrate when he presented the games to the Romans: Cassius Dio, 55, 10, 11.

<sup>4</sup> Even though we know that the praetor could sometimes put *manumissio* into effect in the street too, uttering the formula *e plano* or *ex aequo loco*, by contrast with the act of uttering it *e tribunali* or *ex superiore loco*: Gaius, *Institutiones*, 1, 20, *Maiores vero triginta annorum servi semper manumitti solent, adeo ut vel in transitu manumittantur, veluti cum praetor aut pro consule in balneum vel in theatrum eat*.

<sup>5</sup> Also in the anthropological one: see Gell, 1998, 159-63; particularly 162: "Style is what enables any artwork to be referred to the whole(s), or larger units, to which it belongs". In the following analysis we will select texts and evidences whose formal features identify them as belonging to the same larger unit (Roman linguistic utterances provided with efficacy).

each of their actions with the formula, “may it be good, prosperous, happy and successful!” (*quod bonum, faustum, felix fortunatumque esset*).<sup>6</sup> Here is a formula that clearly presents an utterance in the *fari* (*prae-fari*) mode: the ability to influence the course of a given event was attributed to the utterance. It is a concrete example of effective speech. But how is this formula constructed?

First, we find four adjectives, all characterised by a labial in the initial position (*b / f*); the last three appear to be more specifically linked by alliteration in *-f*, the first three are isosyllabic, and finally, the fourth and last element has more syllables than the previous ones. That is more than enough to say that, in terms of style, the *prae-fatio* so beloved of the *maiores* clearly draws on the resources of *analogy*, as much phonetic as rhythmic. In other words, to bring about this utterance the constituent elements of speech are selected according to their rhythmic and phonetic similarity. But in terms of meaning the *prae-fatio* also leans fundamentally on the principle of analogy. In effect, the four adjectives used here are practically synonyms, illustrating the same semantic nucleus: the success of the event, its favourable or successful outcome. This way of structuring the speech using synonyms is the principle that Robert Lowth calls ‘parallelism’ when analyzing the poetic parts of the Bible in the eighteenth century. More exactly, it would be a ‘synonymous parallelism’ that is activated “when the same sentiment is repeated in different, but equivalent terms”.<sup>7</sup>

What conclusion can we draw from this first utterance expressed in the linguistic mode (*prae-*) *fari*? That the act of *fari* generally corresponds to an utterance with a ‘poetic’ character, if we give this word the meaning it has taken after Roman Jakobson: for an utterance of this character the “principle of equivalence is projected from the axis of selection on to the axis of the combination”.<sup>8</sup> To formulate an effective augury the *maiores* built a syntagm made up of morphemes characterised by reciprocal analogies both in terms of

<sup>6</sup> Cicero, *De divinatione* 1, 102: *neque solum deorum voces Pythagorei observaverunt, sed etiam hominum, quae vocant omina. Quae maiores nostri quia valere censebant, idcirco omnibus rebus agendis “quod bonum, faustum, felix fortunatumque esset” prae-fabantur, rebusque divinis, quae publice fierent, ut “faverent linguis” imperabatur, inque feriis imperandis ut “litibus et iurgiis se abstererent”. Itemque in lustranda colonia ab eo qui eam deduceret, et cum imperator exercitum, censor populum lustraret, bonis nominibus qui hostias ducerent eligebantur. Quod idem in dilectu consules observant, ut primus miles fiat bono nomine.* What is at issue is a principle which Pliny the Elder, *Naturalis Historia*, 28, 1,0 has very frankly identified: “the greatest and most difficult problem is that of the remedies that come from a human agent, that is, whether the words and incantations and religious formulae possess power or not (*polleantne aliquid verba et incantamenta carminum*)”.

<sup>7</sup> Lowth 1787, II, Lecture XIX, *The Prophetic Poetry is Sententious*, 24 ff., 35 ff.

<sup>8</sup> Jakobson 1960, 350-77.

phonetic and rhythmic form and in terms of semantic content. The formula of the *praefatio*, in short, coordinates elements belonging to a single paradigm, both phonetic and rhythmic (words that start with labial or bilabial spirants, the first three composed of the same number of syllables) and semantic (words that relate to ‘happy’ or ‘favorable’): *bonus, felix, faustus, fortunatus*. But let us try, for a moment, to reason *e contrario*. Could the *maiores* have formulated a different utterance, which would still result in their undertaking being a good augury? An utterance formulated according to the usual patterns of speech composition? Certainly; for example, a syntagm like *quod bonum, laetum, honestum perfectumque sit*, built from words covered by different paradigms both in terms of signifier and in terms of the signified, could convey more or less the same meaning. It turns out, however, that the *maiores* chose morphemes that belonged to the same phonic, rhythmic and semantic paradigm, i.e. to extremely close paradigms.

Turning to a second utterance that follows the mode of *fari*. When Varro speaks to us about the *verba* that the *praetor* utters (*fatur*) when passing sentence, he calls them *certa verba legitima* ‘unquestionable words that make law’: so these are words which belong to the register of solemnity; as such, they are fixed, clearly defined, and they produce a specific *effect*. These *certa verba legitima* of the *praetor* were perceived as a single and unique formula, generically called *tria verba* ‘the three words’. Varro tells us what these *certa verba legitima* corresponded to: it was the expression *do dico addico*, ‘I give, I judge, I assign’.<sup>9</sup> This is the utterance that the *praetor* actually enunciates, following the mode of *fari*. Needless to say these *tria verba* are related according to the principle of analogy. They consist of a strongly marked alliteration, centred on the *d*, and formed under the law known as *cola crescentia*: a word of one syllable, followed by a word with two syllables, then a three-syllable word. As these three words are characterised by long syllabic quantities, the result is a sense of extreme slowness and solemnity. The final element of the series, the longest (*addico*), includes the penultimate (*dico*), in an elegant etymological configuration. Thus, a semantic similarity between the last two elements of the series is established (a ‘synonymous parallelism’ is enabled). Let us try, again,

<sup>9</sup> Varro, *De lingua Latina*, 6, 7, 53: *Contrarii horum vocantur dies nefasti, per quos dies nefas fari praetorem “do,” “dico,” “addico”; itaque non potest agi: necesse est aliquo eorum uti verbo, cum lege quid peragitur*; 6, 4, 30: *Hinc fasti dies, quibus verba certa legitima sine piaculo praetoribus licet fari; ab hoc nefasti, quibus diebus ea fari ius non est et, si fati sunt, piaculum faciunt*. On the meaning of *certa verba* cf. Fynticoglou and Voutiras 2005, 160 ff.; Macrobius, *Saturnalia*, 1, 16, 14: *fasti sunt quibus licet fari praetori tria verba sollemnia, do dico addico*; Ovid, *Fastorum libri* 1, 47: *ille [dies] nefastus erit, per quem tria verba silentur*; the complete formula *do dico addico* appears in *CIL* III 1933 = *ILS* 4907 (*lex Saloniitana*).

to invent a fictional example for the reverse perspective. The *praetor* could have used a series of *tria verba* roughly equivalent to the first, such as *do aio tribuo*, drawing on paradigms distinct from one another both from a phonetic and semantic point of view. However, the choice was made in favour of expressions which related to each other on both levels. We thus return to what we said above about the poetic utterance—in the sense that Jakobson has given to this adjective—as well as specific criteria relied on by the ‘combination’ of elements of speech in this type of composition: similarity.<sup>10</sup>

Now our investigation should look to other forms of Roman ‘speech’ which appear to share more than one characteristic with the speech we have just examined. We will attempt to do so synthetically.

Let us take the quality *facundus*, the orator who has the innate *virtus* of spirit: a word that Quintilian, however, still considers outside the sphere of *eloquentia*, namely speech organised by the rules of a true discipline. The adjective that describes this type of orator, *facundus*, relates once again to *fari*. The analysis that we performed in our previous study shows that the individual said to be *facundus* is distinguished by admirable spirit, which rises to the surface and which manifests itself in a privileged few who have received this gift as a seer receives the gift of predicting the future. The *facundus*, in short, has a power over words that ‘speaks to him’, as an independent ‘agency’.<sup>11</sup> At present, if we observe some archaic evidence about *facundia*, we discover that this type of speech is also situated in the analogical register. In Plautus’ *Prisoners*, the slave Stalagmus must face his former master, Hegio. The dialogue which unfolds between them is not simple, because, years ago, Stalagmus had fled from Hegio’s household, removing, moreover, one of his sons, whom he later sold. So his master threatens him, but the slave retorts:<sup>12</sup>

*Stal. Eia, credo ego imperito plagas minitaris mihi!  
tandem ista<ec> aufer, dic quid fers, ut feras hinc quod petis.  
Heg. Satis facundus. Sed iam fieri dicta compendi volo.*

**Stal.** Hey, don’t imagine that it’s some novice that you’re threatening to strike! That’s enough, tell me what you’re offering, if you want what you’re looking for.

**Heg.** You are very *facundus*! But I’d rather save my breath.

<sup>10</sup> Even though the comparison may seem bizarre, one might think of the famous slogan of General Dwight Eisenhower, ‘I like Ike’, analysed by Jakobson (1960) on account of its ‘poetic’ structure; cf. also Latin formulae such as *dat donat dedicat*; etc.

<sup>11</sup> Bettini 2008a, esp. 344 ff.; Duranti 2007, 73 ff.

<sup>12</sup> Plautus *Captivi* 963 ff.

This translation does not do justice to Stalagmus's *facundia*, because the slave exhibits it in a sentence that is a small masterpiece of parallelism and assonance. Indeed, the message is contained in a strongly anaphoric phonetic model (*au-fer...fers...feras*), which manages to communicate three distinct meanings—‘stop...make your offer...take what you want’—while drawing on the same verb three times. The linguistic ability of Stalagmus, defined as *satis facundus*, is indisputably realised in an analogical style, which recalls the style used in religious formulae or in other similar contexts.<sup>13</sup>

Finally, the speech of archaic poetry deserves a separate discussion, based on the few verses that have come down to us in the epigraphic or literary tradition and from the comic and tragic archaic authors. We know that the Saturnian verse—that is to say, the metrical form that the Romans regarded as being the origin of their poetic tradition—was associated with *vates* and *fauni*: the very figures which, contextually, were awarded the faculty of prophetic *fari*.<sup>14</sup> So, in archaic Roman culture, production in verse was also related, at its origin, to the sphere of *fari*, strong and effective speech. Likewise, the plays created by archaic tragic and comic writers were called *fabulae*, another term related to the sphere of *fari*.<sup>15</sup> But let us look at the concrete evidence—the utterances—of poetic speech, especially in theatre, in archaic Rome. We will find without difficulty the construction of speech which resorts to analogical forms of a type similar to those that the priest, the praetor and the *facundus* used, as we have just seen.

It is sufficient to think of a Saturnian verse such as the following, taken from Livius Andronicus' *Odusia*:<sup>16</sup> *matrem <proci> procitum plurimi venerunt* ‘many suitors came to ask for the hand of the mother’. Here we note emphatic alliteration on *p*—followed by a liquid or a rolled consonant, anticipated by the

<sup>13</sup> As another example of analogical utterance by an archaic orator, see e.g. this fragment of the speech in which Cato attacked Termus, accusing him of having murdered ten people: *tuum nefarium facinus peiore facinore operire postulas, succidias humanas facis, tantam trucidationem facis, decem funera facis, decem capita libera interficis, decem hominibus vitam eripis, indicta causa iniudicatis incondemnatis* (Cato, *Orationes* fr. VII 59 Malcovati).

<sup>14</sup> Varro, *De lingua Latina* 7, 36: *versibus quo[s] olim Fauni vatesque canebant. Fauni dei Latinarum, ita ut et Faunos et Fauna sit; hos versibus quos vocant Saturnios in silvestribus locis traditum est solitos fari <futura, a quo> fando Faunos dictos*; cf. Servius, *Commentarius in Vergilium*, *Georgica* 1, 11; Ennius, *Annales* 207 Skutsch. On Propertius, who adopts the persona of a *vates* and pronounces his ‘*labor*’ at the beginning of his elegy for Tarpea, cf. Bettini 2008a, esp. 368 ff.

<sup>15</sup> On the relation between *fari* and *fabula* cf. Ferro 2005; Bettini 2008a, esp. 363 ff.

<sup>16</sup> Livius Andronicus, *Odusia*, fr. 7 Morel.



*tr* in *matrem*. Again, consider a Saturnian verse from Nevius' *Bellum Punicum*:<sup>17</sup> *virum praetor aduenit auspicat auspicium / prosperum* 'the commander of troops arrives, takes favourable auspices', where the poet inserts a series of *au* in a framework of *pr-*, in turn surrounded by two- *rum* (*vi-rum ... prospe-rum*), phonetically similar, but performing different grammatical functions; this is not to mention the countless examples offered in the poetry of Plautus, whose search for phonetic analogies, while at times obsessive, greatly conditioned the form of the utterance.<sup>18</sup> Should we understand that, for the Romans of the archaic age, poetic speech, and especially theatrical speech, was also an authority and, as such, was effective? If one wishes to answer this question, crucial for understanding the function of the oldest poetry, it is certainly not enough to reiterate once again the old story of (supposedly) original magico-religious linguistic forms. Moreover, it is superfluous to emphasise that the elements that characterise the language of archaic Roman poetry cannot simply be regarded as the dregs or remnants of another language. We should rather think that the prophet, the priest, and the poet too, have recourse to analogical speech—that is to say effective speech—for different purposes, purposes linked to the practice that each exercises.<sup>19</sup> What, as regards the poet, could be the specific *function* reserved in Rome for effective speech?

## 2. 'Attracting with Bait': The *Delectatio* of Poetry and Music

One can imagine that the anonymous author of funeral *elogia*, the character on stage or indeed the poet who narrates the action of the *maiores*, needed an effective speech for their fiction to be appreciated, but above all, to capture the imagination of the addressee: to borrow a famous phrase of S.T. Coleridge, they certainly counted on these devices to create "the willing suspension of disbelief for the moment, which constitutes poetic faith".<sup>20</sup> But even without turning to the author of *Lyrical Ballads*, there is evidence at the heart of Roman culture which proves to be of great interest in connection with poetic efficacy.

<sup>17</sup> Naevius, *Bellum Punicum*, fr. 36 Morel; for the interpretation of *virum praetor* see Mariotti 2001, 66 ff.

<sup>18</sup> See the masterly discussion of Traina 1999, 55 ff.

<sup>19</sup> On the supposed derivation of archaic poetic diction, together with judicial and sacerdotal forms of speech, from an origin in the language of magic or incantation cf. e.g. Güntert 1921; repeated by Hofmann and Szantyr 1972, 700 ff.

<sup>20</sup> Coleridge 1973 (= 1907), 5-6; cf. Bettini 2008b, 27-64.

In the preamble to the third book of the *Georgics*, Virgil draws up a directory of topics dear to poetry. He also gives us an exemplary definition of poetic efficacy: *cetera, quae vacuas tenuissent carmine mentes* ‘all other things that could subdue the mind released by the song’. There is thus a double movement: as a result of *carmen*—we will return to this word at the end of the paper—the mind ‘escapes’ from its usual concerns, while being at the same time ‘subdued’ by poetic power. In the mind of the listener, the dimension of everyday life disappears to be replaced by that which the *carmen* arouses. To return, as ever, to the cultural categories of the Romans, we might as well say that the *mens* of whoever listens to poetry *delectatur*, knowing that *delectare* does not mean ‘delight’, as it is usually interpreted, but rather to ‘hold where one wants’ or ‘attract with bait’, which is the basic meaning of this term. Indeed *delecto* is a compound of the verb *lacio* which, in turn, derives from a root word *lax*, which means ‘bait, cunning, deception, seduction’.<sup>21</sup> It is about this that the Academic Cicero—he of the second book of *De divinatione*—offers the most interesting testimony:<sup>22</sup>

*At multi saepe vera vaticinati, ut Cassandra: “iamque mari magno . . .” eademque paulo post: “eheu videte!” Num igitur me cogis etiam fabulis credere? Quae delectationis habeant quantum voles, verbis sententiis numeris cantibus adiunguntur; auctoritatem quidem nullam debemus nec fidem commenticiis rebus adiungere. Eodemque modo nec ego Publicio nescio cui nec Marcii vatibus nec Apollinis opertis credendum existimo; quorum partim ficta aperte, partim effutita temere numquam ne mediocri quidem cuiquam, non modo prudenti probata sunt.*

But you say that many prophets have predicted the truth, such as Cassandra: “Already on the vast sea” and a little later on: “Alas! See”. So do you want make me believe (*credere*) in theatre performances? These performances attract us with their bait (*delectationis habeant*) as much as you like, benefiting from language, syntax, rhythm, song; but we must not recognise any authority (*auctoritas*), nor have any faith (*fides*) in these fictions. And so I hold that we should not believe any random Publicius or the prophecies of the Marcii or the riddles of Apollo, which are sometimes obvious fictions, sometimes nonsense that never inspired confidence even to a mid-level mind, let alone to an enlightened man.

As a good rationalist—the role he has chosen in the work—Cicero argues that we should ‘believe’ neither in the poetic compositions recited or sung in the

<sup>21</sup> Virgil, *Georgica*, 3, 3 f.; cf. the comment of Servius *ad loc.* On *delectare* as ‘carrying away’ the mind, ‘holding it fast wherever one wishes’—characteristic of the *fabula* and of poetry—cf. Ferro 2005, 139 ff. On *lax* and *lacio* see Ernout and Meillet 1951 s. v.

<sup>22</sup> Cicero, *De divinatione* 2, 113; Ennius, *Alexander*, Scaenica 54 ff. Vahlen, 32 ff. Jocelyn.

theatre, nor in the prophecies uttered by *vates* such as Publicius or the Marcii nor in the ambiguous oracles of Apollo. At the same time, he shows us explicitly that the *delectatio* produced by the poetic *form*, in its verbal, syntactic, rhythmic and melodic components, was capable of exerting real *auctoritas* on people, inspiring their *fides*. It seems like the voice of Coleridge: the dramatic *fabulae* have the power to cause 'poetic faith' in the hearts of their audience. There is an unbreakable bond between on the one hand, *delectatio*—the ability 'to hold where one wants' or 'attract with bait' that produces the stylistic form—and, on the other hand, *auctoritas*—namely, the ability to pronounce effective utterances.

As Cicero said explicitly, in the production of poetic *delectatio* what is in play is not only the composition of language, syntax and rhythm, but also that of the *cantus* (another word we will go back to in a moment): that is to say, the specifically musical component of dramatic poetry. It is also an affirmation that a Roman would perceive as perfectly natural. The entire archaic theatre production, it is well known, was based not only on the resources of speech, but also on music and singing, because in every production recited scenes alternated with sung scenes. "Evidence from the plays, Cicero, and the manuscripts" writes Timothy J. Moore "reveals that with only a few exceptions, verses written in the meter known as iambic senarius were *deverbia* and were performed unaccompanied, but scenes and passages written in other meters were *cantica*, during which the *tibicen* played . . . We should therefore envision Roman comedies not as plays with musical intervals, but as musical performances with non musical introductions and breaks". We also know that in some cases, a *tibicen* could appear as a soloist on the stage for real musical interludes. The *modi* were not composed by the poet himself, but were the work of *periti* in this art, professional musicians some of whose names have come down to us.<sup>23</sup>

<sup>23</sup> Moore 2012, 15-16; 2008, 3-46; *Excerpta de comoedia*, 8, 9 ff.: *deverbia histriones pronuntiabant, cantica vero temperabantur modis non a poeta sed a perito artis musicae factis. neque enim omnia isdem modis in uno cantico agebantur sed saepe mutatis, ut significant qui tres numeros in comoediis ponunt, qui tres continent 'mutatis modis cantici'. 10 eius qui modos faciebat nomen in principio fabulae post scriptoris et actoris superponebatur. 11 huiusmodi carmina ad tibias fiebant, ut his auditis multi ex populo ante dicerent, quam fabulam acturi scaenici essent, quam omnino spectatoribus ipsius antecedens titulus pronuntiaretur. agebantur autem tibiis paribus, id est dextris aut sinistris, et imparibus. dextrae autem tibiae sua gravitate seriam comoediae dictionem pronuntiabant, sinistrae [Serranae] acuminis levitate iocum in comoedia ostendebant. ubi autem dextra et sinistra acta fabula inscribebatur, mixtim ioci et gravitates denuntiabatur. Cf. Donatus, *Praefatio* 1, 7 to each of the five comedies of Terence on which he comments (*Aeli Donati quod fertur Commentum Terenti*, ed. P. Wessner, Teubner Leipzig 1902, I-III); Duckworth 1952, 361 ff.; Landels 1999, 182-9; Baudot 1973, 57-65. The evidence mainly relates to the practices of the comic theatre, but*

We shall return to this fundamental aspect of Roman perception of the poetic phenomenon, that is to say, its extreme contiguity with the sphere of music. But what should be emphasised now is that, for the Romans, music also, in general, had the capacity to produce *delectatio*. As the slave Pseudolus publicly declares, when leaving the stage for a moment: *exibo, non ero vobis morae, tibicen vos interibi hic delectaverit* ‘I’m going; you won’t have to wait too long. Meanwhile, the *tibia* player will entertain you (relieve your mind)’.

In Rome one attributed such an effect to the *delectatio* produced by the music, which could be seen as independent of the will of individuals, and able to avoid the usual rules of morality and *decorum*. A slave in Plautus, Sagarinus, urges the *tibicen* to play on his flute a *cantio* which is ‘pretty, graceful, lascivious (*cinaedica*), which tickles us (*perpruriscamus*) right the way to the fingertips’. The melody played by the *tibicen* will have the power to excite sexual desire, by inducing the ‘tickling’ sensation all the way to the body’s extremities. Indeed, as Augustine points out, there are in music ‘attractive sides (*qui delectent*) certainly, but which are very vulgar (*vilissima*)’—and their vulgarity does not much diminish their power of seduction. This is why Quintilian recalled that the speaker must certainly have knowledge of music, but only as ‘knowledge of a method (*ratio*) that serves to excite and calm the passions’. The *delectatio* produced by music is powerful and this is the reason why you need to know how to master it. But let us leave aside the powers of music to return to those of poetry.<sup>24</sup>

Naturally, there is reason to believe that a poet active in archaic Rome should seek to *tenere* or *delectare* the mind of his audience through the use of instruments of his cultural tradition, namely the instruments of analogical speech. It is again Cicero who confirms this supposition, with an example as explicit as it is fascinating:<sup>25</sup>

*in terram enim cadentibus corporibus isque humo tectis, e quo dictum est humari, sub terra censebant reliquam uitam agi mortuorum; quam eorum opinionem magni errores consecuti sunt, quos auxerunt poetae. frequens enim consessus theatri, in quo sunt mulierculae et pueri, movetur audiens tam grande carmen:*

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there is no reason to think that those involved in tragic theatre operated in a different way; there are indeed some indications that they were very similar.

<sup>24</sup> Plautus, *Pseudolus*, 573 ff.; *Stichus*, 760 f.; Augustine, *De musica*, 1, 2, 2; 1, 2, 3; etc. Quintilian, *Institutio oratoria*, 1, 10, 31.

<sup>25</sup> Cicero, *Tusculanae* 1, 37, on three verses of an unknown tragedy, vv. 73 ff. Ribbeck.

*"Adsum atque advenio Acherunte vix via alta atque ardua  
Per speluncas saxis structas asperis pendentibus  
Maxumis, ubi rigida constat crassa caligo inferum".*

We came to believe that the dead, having fallen upon the earth and having been buried, whence the word *humari*, would live forever under the earth. This is what gave rise to gross errors which poets have reinforced. A large crowd, full of women and children, sitting in the theatre, is moved when it listens to such a majestic *carmen* as this: "Here am, I come from Acheron, with great difficulty by a deep and arduous path / through caves formed by rough, menacing rocks / immense, where the heavy, icy darkness of Hell thickens".

Poets are given back the ability to lead people to believe statements that have no foundation—in this case, life in the hereafter. This unfounded belief rests on 'emotion' caused by the *carmen*, the poetry; but it will not escape us that the *tam grande carmen*—a *canticum* in trochaic septenaries accompanied by the *tibiae*—which women and children listen to with emotion, is obviously constructed according to the rules of analogical speech, so that translation inevitably sterilises all its emotive force. Just like the caverns of Hell, the three tragic verses quoted by Cicero are composed of a series of verbal 'blocks' bound to each other by a network of phonetic analogies articulated on the axis of similarity. This is an explicit example of poetic *delectatio*—in the sense of 'to hold where one wants', 'attract with bait'—which, through the power of the stylistic form of the utterance, has the ability to exercise *auctoritas* on those who listen, directly causing their *fides*. The fascination caused by the analogical speech meant that the dead really are there: the style has the power to make actual not only the invisible but also the non-existent. We may recall what J.-P. Vernant remarked, in connection with archaic Greek poetry: "The symbolic value of procedures in archaic poetry is that the verbal image does not function as a simple copy, decal or *analogon* any more than does the figurative representation; it is endowed with efficacy; it gives listeners the feeling that, through expressions that evoke a certain type of power, this particular force is effectively mobilised, that it unfolds, through performance of the poetic text, to perform the work which is proper to it".<sup>26</sup>

On this point we could give many more examples. Take the two couplets engraved on the tomb of Scipio Hispanus, *praetor peregrinus* in 139 BC. The *elogium* is presented as a speech that the deceased utters in person:<sup>27</sup>

<sup>26</sup> Vernant 1990, 22.

<sup>27</sup> *CIL* I-2, 2, 15 = D. 546.

*virtutes generis meis moribus accumulavi  
progeniem genui facta patris petiei  
maiorum optenui laudem ut sibi me esse creatum  
laetentur. stirpem nobilitavit honor*

By my morals (*meis moribus*) I increased my virtues (*progeniem genui*), I had children, I competed with the brilliant deeds of my father (*patris petiei*). I kept the reputation of my ancestors (*laudem*), so they can rejoice (*laetentur*) in having begotten me. The honours I have received have ennobled my lineage.

The main Roman noble values are concentrated in these four lines: the crucial importance of lineage, the spirit of emulation of the father, the inherited reputation of the *maiores*, and above all their presence as they continue to judge the behaviour of their descendents.<sup>28</sup> How does the poet manage to *tenere* and *delectare* the *mens* of the addressee, in order to give the impression that this is Scipio Hispanus who is speaking, as demanded by the epigraphic fiction? Which is to say, how does he *actualise* the deceased to one who reads the inscription on the stone, so that what Scipio said may 'be believed'? It is precisely by using the analogical form which represents the register of effective speech in archaic Rome: *progeniem genui* . . . *patris petiei*, and so on, with parallels in semantics, syntactics, and assonance. To borrow a phrase used by Jon Landaburu in another context, we are faced with a real "grammatical treatment of the truth."<sup>29</sup>

As for stage poetry, Plautus himself describes his power through the mouth of the slave Pseudolus:<sup>30</sup>

*sed quasi poeta, tabulas cum cepit sibi,  
quaerit quod nusquamst gentium, reperit tamen,  
facit illud veri simile, quod mendacium est,  
nunc ego poeta fiam*

In the manner of a poet, who, when he has taken his tablets, seeks what exists nowhere and yet ends by finding it, and who makes similar to truth what is deceptive—I'll now become a poet myself.

<sup>28</sup> Bettini 2009; Lentano 2007, 163.

<sup>29</sup> Landaburu 1976 (quoted by Severi 2008).

<sup>30</sup> Plautus, *Pseudolus*, 401 ff. On the efficacy of theatrical performance in archaic Rome, see also the famous remark of Naevius in the *Tarentilla* (fr. I Ribb.3): *quae in theatro meis probavi plausibus / ea non audere quemquam regem rumpere: / quanto libertatem hanc hic superat servitus!* Cf. Barchiesi 1978, 2 ff.



Like the Cicero of the *Tusculans*, Plautus knows well that the poet's speech is powerful, capable of giving life to what exists nowhere, until it is no longer possible to distinguish truth from falsehood. The stage poet is a magician of *delectatio*; thanks to his art, the *spectatores* will be unable to separate the true and the false. Once again, how is the *poeta* able to produce this result? Consider an unquestionably relevant example and it will be easier to bring out the categories that we seek. This is the moment when, in the prologue of *Amphitruo*, the location and characters of the *fabula* which will be performed are stated and shown:<sup>31</sup>

*Haec urbs est Thebae. in illisce habitat aedibus  
Amphitruo, natus Argis ex Argo patre,  
quicum Alcumena est nupta, Electri filia*

This is (*haec*) the city of Thebes. In this (*in illisce*) house dwells Amphitryon, born in Argos to Argos his father, he has a wife Alcmena, daughter of Electryon.

By his words, once again, the poet has managed to 'find' what exists nowhere and make *veri simile* that which is *mendacium*. From that moment, the spectators will not be in front of a wooden floor, but in Thebes, the ancient city where, at the end of the comedy, the birth of Hercules will be announced; the people who will soon enter and exit these residences are no longer mere *histriones*, but the heroes of myth.<sup>32</sup> Why is the public willing to accept all this, despite the absolute conventionality which characterises the Roman stage?<sup>33</sup> Observe the linguistic form of the text. In the first verse, the parallelism between *haec* and *illisce* not only creates a symmetry in the utterance, but also clearly circumscribes the space of the action on stage; in addition, one may notice a subtle phonic echo between *Thebae* and *habitat aedibus*, sufficient to generate instant *delectatio* in the minds of spectators. Nevertheless, the following verses are much more significant. There is a series of mythological names beginning with A-: *Amphitruo* ... *Argis* ... *Argo* ... *Alcmena*, as if in order to become a character

<sup>31</sup> Plautus, *Amphitruo*, 97 ff.

<sup>32</sup> The transformational magic performed in the theatre is explicitly underlined by Plautus in the *Menaechmi*, 72 ff.: *haec urbs Epidamnus est dum haec agitur fabula: / quando alia agetur aliud fiet oppidum; / sicut familiae quoque solent mutarier: / modo hic agit leno, modo adulescens, modo senex, / pauper, mendicus, rex, parasitus, hariolus*: 'This city is Epidamnus, for as long as this comedy continues; when another play will be performed, it will be a different town. The actors too will be transformed; the same actor is sometimes a *leno*, sometimes an *adulescens*, sometimes a *senex*, a poor man, a beggar, a king, a parasite, a prophet.'

<sup>33</sup> Cf. Dupont 1985, 65 f.

or a location in this *fabula*, a person or place had to be distinguished by a feature that was above all an analogical one. The register of effective speech this time has the power to create theatrical space, just as the speech of the augur creates a space of *auguratio*. This is what we call, probably not by chance, the ‘magic’ of theatrical speech.

### 3. The ‘Resultant Voice’ of the Analogy as a Source of Efficacy

Now that we approach the goal of our exploration, we should try to close the circle that we opened at the beginning. As we have seen, on the one hand there are some enunciative modalities that the Romans identified with *fari* and which presuppose the production of an *effective* speech, *causing authority*: the latter seems to be based on the presence of a superior “agency”—a god, a supernatural force, or at least some source or other of authority—which stands behind the speaker; on the other hand we have utterances, registered in the enunciative modality of *fari*, which are built following the principles of parallelism and analogy. It is therefore logical to conclude that the authority and effectiveness of this type of speech is, in one way or another, related to its analogical construction. In other words, it is permissible to assume that the presence of parallelism and phonetic and rhythmic iterations at the heart of the utterance represents the visible and tangible *manifestation* of the superior ‘agency’ on which it rests. But how?

To answer this question, we must first emphasise once again that the statements considered so far are realised in a space that is not graphical, but sonic. The formulae for good augury, the *tria verba* of the *praetor*, the Saturnian verses of Livius Andronicus, the verses of Plautus or tragic poets are conceived to be spoken aloud: it is us—moderns, readers, philologists—who consign them to the written page. So we must imagine the effective speech in question here as taking shape in the dimension of sound. However, ethnomusicologists—and also musicians interested in the anthropology of music, such as Luciano Berio—are familiar with a phenomenon that has become known as ‘resultant melody’ or ‘resultant rhythm’. This works as follows: when two or more musicians play together, they end up producing a sequence—rhythmic or melodic—distinct from the parts that each instrumentalist performs separately, but resulting from their combination. In short, this is a very real sound sequence, perfectly audible, but that no one in particular plays. It becomes interesting to us, if we consider the role that the phenomenon of the resultant holds in the poetic practice of the Fang in Cameroon. *Mvet*, the traditional songs of this people,

are sung by poets who are accompanied on a kind of harp. During the performance, the two melodic lines produced on the instrument by each hand can bring out a third melody, unexpectedly, in addition to the others, as a 'result'. Such a melody, to which the instrumentalist attributes a life of its own because he does not think that he is producing it himself, is identified with the 'hidden voice' of the spirits of *mvet*. In the words of Carlo Severi, "it's the voice that expresses, in the eyes of Fang musicians, the source, and therefore the authority of tradition".<sup>34</sup> In sum, a voice which raises itself autonomously (or so it seems) in the midst of others, becomes the voice of the spirits, that of tradition and authority.

If we keep in mind the 'hidden voice' of *mvet*, let's see what happens, for example, when the 'ancestors' *præfantur* the formula *quod bonum, faustum, felix fortunatumque esset*. Within the utterance, we also hear a *result* taking form while passing from one sound element to another, linked together by the thread of analogy. A reference to the classic theory of the double articulation of language, formulated by Andre Martinet, can help us to express our thoughts more clearly.<sup>35</sup> Take a normal utterance like *quod bonum, laetum, honestum perfectumque sit*, namely the simulated *præfatio* we constructed above. As in any linguistic utterance, also in this one we see the action of the units of the first articulation, the monemes/morphemes (the smallest meaningful units), that is to say, words or suffixes whose combination communicates the meaning of the message; in conjunction, we also see the action of the units of second articulation, the phonemes (the smallest distinctive units) which, although not meaningful, allow us to distinguish the words one by one. Now consider the true and analogical *præfatio*: *quod bonum, faustum, felix fortunatumque esset*. As in the former case, we see the action of the units of first articulation (monemes/morphemes), which form the sense, and units of second articulation (phonemes)—plus, in addition, units which could be called of *third* articulation: the elements *fau-...fe-...for-...*, which are used neither to fix meaning nor to distinguish one moneme from another, but which are ordered so that they produce an effect of prolonged sound similarity. This phonetic line that insinuates itself within and emerges between the first and second articulations of the utterance is, in our opinion, the 'voice' through which the presence of a superior 'agency' is revealed—whether it is a deity, the *auctoritas* of the *res*

<sup>34</sup> Severi 2008, 104; Boyer 1988 (cited in Severi, op. cit.). Berio 2006, 46 f. (concerned with the Banda Linda of Central Africa and with the pentatonic melody which arises from a group of forty trumpeters, without any of them actually playing it).

<sup>35</sup> Martinet 1960, 22-30.

*publica* or the mesmerizing power of poetry: that is to say the very same source which guarantees both the authority and efficacy of the speech.

#### 4. A Poetic and Musical Anthropology of *Carmen*

To conclude our observations, we would like to make some reflections on poetic and musical anthropology. Indeed, the modern perception of events related to poetry, textual production, the production of music and song, is decidedly different from the one that was specific to Roman culture, especially during its archaic phase. First, we moderns perceive instrumental music and singing as contiguous yet distinct practices. Secondly, in our culture, poetry forms a quite specific genre, well individuated within textual production. But what is particularly remarkable is that, in our culture, musical production and the production of poetic text are situated in two decidedly separate fields. In Rome, especially during the archaic period, quite the opposite was true.

In fact, all the phenomena we have discussed—from poetry to song and music—relate, one might say, to a single and unique modality of perception. This modality of perception is expressed through a family of words derived from the same root, which generally designates all these manifestations: *canere*, *cantus* and *carmen*. With *cano* and *cantus* one could refer equally to the song, properly so-called, to the sound emission of a musical instrument, to the music which emerges from a set of different instruments, and to that which is produced by the combination of voices and instruments. At the same time, *cano* and *cantus* could also refer to the practice of poetic composition. Similarly, the term *carmen* could indicate either the song or the sound emission of musical instruments or poetic composition. Thus in Roman culture singing, music and poetic composition converge in the same perceptual category, which blurs together the outlines of the practices that we tend to separate. From our perspective, however, it is the word *carmen*, especially in its meaning of verbal creation, which is of most interest.

As Latin scholars know very well, in the archaic period *carmen* did not indicate that a poetic composition was realised according to the rules of quantitative metre: more generally, archaic Romans called *carmen* any utterance that had specific stylistic characteristics which made it instantly recognisable as a *special* text, that is to say, destined for a use that was not ephemeral, part of ordinary speech. By the name *carmina* they also indicated *precationes*, *oracula*,

prophecies, spells, legal formulae and so on; that is to say utterances which, in one way or another, could or should be *re-used*.<sup>36</sup>

The centrality of *carmen* within Roman culture is also evidenced by the fact that to this form of composition there was a correspondence in the divine sphere. With *carmen* the Romans indeed associated a prophetic deity who derived her name—as Roman *numina* often do—from the *officium* to which she was devoted: *Carmenta* or *Carmentis*. A temple was dedicated to this goddess near the *Porta Carmentalis*, between the Tiber and the Capitol, and every year on the 11th and the 15th of January a minor flamen celebrated in her honour festivals called the Carmentalia.<sup>37</sup> From our point of view, it is worth noticing that *Carmenta* also embodies a relevant aspect of our subject: the *delectatio*, the power to cause ‘poetic faith’ that was considered typical of the *carmen*. In fact, the Romans connected both the name of the goddess and her assigned province, the *carmen*, directly with a loss of mental control—the same loss of control in which, according to Vergil, the power of poetry consists (‘things that could subdue the *mens* released by the *carmen*’). As Plutarch says, ‘The true meaning of the name [*Carmenta*] is “deprived of mind (*nóus*)”, by reason of her divine transports. Wherefore *Carmenta* was not so named from *carmina*, but rather *carmina* from her, because, in her divine frenzy, she chanted oracles in verse and metre’. And Isidore of Seville: *carmini datum nomen . . . quod, qui illa canerent ‘carere mente’ existimabantur* ‘the *carmen* has been given this name because those who sung them were considered deprived of mind’.<sup>38</sup>

But to return to our subject, what are the stylistic features that allow one to define a given linguistic utterance as *carmen*? They are indeed those that we have previously individuated, namely, phonetic and rhythmic similarity, and semantic parallelism. In archaic production, the resources of the analogy could sometimes be combined with forms of quantitative metre, or song and music, as happens in the tragic *tam grande carmen* quoted by Cicero—which in his opinion had the same ability to generate belief in the realm of the dead. We have seen that this is a text composed in trochaic septenaries, accompanied by the sound of *tibiae*, in which we recognise at the same time a series

<sup>36</sup> The bibliography on *carmen* is as well known as it is interminable; but cf. *Thesaurus linguae latinae* sub verbo. See especially Guittard 2001, 173 ff. (Guittard has devoted many valuable discussions to this theme in the past, see more recently Guittard 2007). With the expression “utterances which could or should be re-used” we refer to the well-known “Wiedergebrauchsrede” of Lausberg 1973, tr. Engl. 1998. See also Habinek 2005, 59-65, 239-45.

<sup>37</sup> Servius, *Ad Georgica*, 1, 21: *nomina numinibus ex officiis constat imposita*; on the name of *Carmenta* Guittard, 2001.

<sup>38</sup> Plutarch, *Quaestiones Romanae*, 56, 278b-c; Isidore, *Etymologiae*, 1, 38, 4.

of verbal 'blocks' bound one to the other by a network of phonetic analogies hinged around the axis of similarity.<sup>39</sup> But on other occasions, to produce the desired effect, it was enough simply to employ the resources of phonetic, rhythmic and semantic similarity, consisting of utterances in which, as we have seen, we can recognise the presence of a 'resultant voice' woven from the thread of the analogy.

Finally, let's try to put ourselves as close as possible to the point of view of the Romans, or rather, as close as possible to their point of listening. In the perception of a Roman, a *carmen* characterised by analogical form caused a *delectatio* similar to that aroused in him by poetry, song, and music, and his *mens* was 'subjugated' by emotions specific to *canere* and to *cantus*. The fact is that this distinctively Roman perceptual category included all forms of organised sound, verbal or musical, sung or produced by instruments, produced according to the rules of quantitative metre or by using phonetic and semantic analogy (but also cleverly combining quantitative forms and figures of similarity). In conclusion, in the context of Roman culture the metaphor of the 'resultant voice' as the seat of a superior 'agency', capable of ensuring the efficacy and the authority of a certain utterance, appears much less 'metaphorical' than we might expect.

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<sup>39</sup> We are dealing, moreover, with a 'mixed' form of composition—quantitative metre, phonic similarities and semantic parallelisms—which is common to the majority of tragic and comic texts that we possess: Bettini 1985.



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## Questions d'iconographie musicale: L'apport des terres cuites à la connaissance de la musique dans l'Égypte hellénistique et romaine

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### Abstract

The Graeco-Egyptian terracottas produced during the Ptolemaic and Roman period provides good material for investigating musical life in Egypt. The majority of the Fayum terracottas have been found in tombs, or in private houses as sources of protection and good luck. Most of the motifs are original by comparison with the other terracotta work of the ancient world. Many musicians (*aulos* or *syrix* players, harp players, women with drum or *crotala*) and dancers are shown among deities (mainly Harpocrates, Isis and Bès) and other cult celebrants in religious festivals. Cult practice is a common theme (we can see priests, prayers, wine and animals for sacrifice) and musicians provided performances during procession and festivals. The musician is associated with the cult by his crown (lotus-bud diadem or floral crown) and by the amphora at his feet, and most of them are ithyphallic, thus connoting prosperity. These pieces present an opportunity to investigate the connection between Egyptian and Greek traditions and to compare the motifs with papyrological and textual testimonies about music.

Le terrecotte greco-egiziane prodotte durante il periodo Tolemaico e l'età Romana forniscono un materiale utile per lo studio della vita musicale in Egitto. La maggioranza delle terrecotte del Fayum sono state ritrovate nelle tombe, o nelle case private dove avevano una funzione simbolica di protezione e di buon augurio. La maggior parte dei motivi raffigurati su di esse sono originali in confronto a quelli di altre terrecotte del mondo antico. Molti musicisti (suonatori di *aulos* o di *syrix*, di arpa, donne con tamburelli o con *crotala*) e danzatori sono ritratti tra le divinità (soprattutto Harpocrates, Isis e Bès) e altri celebranti dei culti presenti nei festival religiosi. La pratica del culto è un tema comune (sono rappresentati preti, preghiere, vino e animali offerti in sacrificio) e i musicisti fornivano le loro esecuzioni durante le processioni e i festival. Il musicista è associato al culto per via della sua corona (diadema a forma di bocciolo di loto o corona floreale) e dell'anfora deposta ai suoi piedi, e la maggior parte di loro itifalli, perciò indicanti prosperità. Questi pezzi costituiscono un'opportunità per indagare il legame tra le tradizioni edizioni e greche e per confrontare i motivi raffigurati con i documenti papirologici e testuali riguardanti la musica.

### Keywords

Hellenistic/Roman Egypt, terracottas, musicians, iconography, festivals, domestic religion

Lorsque l'on songe à la musique de l'Égypte ancienne on pense d'abord à l'incroyable richesse de la documentation pharaonique : stèles de musiciens avec leurs titres, fresques des tombeaux thébains, instruments de musique parfaitement conservés exhumés des tombes<sup>1</sup>. Pour la période de l'Égypte sous l'occupation grecque et romaine, la vie musicale peut être appréhendée à partir d'un type de mobilier bien plus modeste : les figurines de terre cuite moulées fabriquées entre le III<sup>e</sup> s. a. C. et le IV<sup>e</sup> s. p. C. à Alexandrie et dans la *chôra*.

La richesse de la documentation pharaonique conjuguée avec le désintéret pour les époques tardives de l'Égypte avaient eu pour effet de détourner l'attention des chercheurs des périodes hellénistique et romaine. Aujourd'hui les conditions sont réunies pour qu'une telle étude soit rendue possible : on assiste à la fois à un regain d'intérêt pour l'Égypte gréco-romaine, à l'essor de la papyrologie et à la multiplication des études sur les terres cuites. La connaissance de la musique et des musiciens repose avant tout sur la papyrologie grâce aux papyrus musicaux qui transcrivent des mélodies notées<sup>2</sup> et aux contrats de musiciens de métier qui détaillent les conditions d'engagement des professionnels<sup>3</sup>. Pour éclairer la signification de ces images on dispose en outre de textes littéraires consacrés à l'Égypte (Strabon parle de la musique des temples dans son livre XVII ; Dion de Pruse, Athénée évoquent les goûts musicaux des Alexandrins)<sup>4</sup>. En revanche les vestiges d'instruments de musique pour cette période sont peu connus, souvent mal datés et pour la plupart dénués de contexte précis<sup>5</sup>. Quant à l'iconographie, elle est en règle générale

<sup>1</sup> On aura un aperçu de cette riche documentation dans les ouvrages de Hickmann 1949, 1956, 1961.

<sup>2</sup> Voir le corpus des inscriptions musicales sur papyri dressé par Pöhlmann et West 2001, avec des papyrus datés de l'époque classique (no's 3-4), de l'époque hellénistique (5-19) et de l'époque romaine (38-61).

<sup>3</sup> On trouvera des exemples illustrés de fragments de papyrus avec contrats de musiciens présentés par H. Harrauer dans Froschauer 2004, no's 11-15, 88-92. Le plus bel exemple est sans nul doute le contrat d'un aulète placé en apprentissage auprès d'un maître à Alexandrie : *BGU* IV 1125 (13 a. C.) ; il est étudié par Bélis et Delattre 1993. Pour le cas des danseurs dans la papyrologie, on dispose désormais de l'étude de Vesterinen 2007.

<sup>4</sup> Voir Athénée traduit et commenté dans Barker 1984 : livre IV, 174 a-185 a ; pour Dion de Pruse : Kasprzyk et Vendries 2012.

<sup>5</sup> Voir en dernier lieu l'étude de Hagel 2010, qui propose de façon convaincante de reprendre de façon définitive la datation de deux tuyaux d'*auloi* du Musée de Berlin achetés en 1894 (que l'on datait autrefois du Nouvel Empire mais que C. Sachs proposait déjà de dater de l'époque

fort peu sollicitée or l'examen des terres cuites figurées se révèle d'un grand intérêt à condition que l'on accepte de confronter cette documentation avec d'autres types d'images ; en particulier, les parallèles avec les petits bronzes<sup>6</sup>, les figurines en faïence ou en plâtre sont riches d'enseignements car il existe une unité thématique dans les œuvres de la petite plastique. La découverte dans une tombe d'époque romaine à Tunah el-Gebel<sup>7</sup> de figurines en plâtre peint reprenant les mêmes dimensions, les mêmes motifs (Harpocrate, Isis, une amphore, des aulètes, des nains danseurs) et les mêmes usages que dans la terre cuite (elles étaient déposées près du corps du défunt) fait la preuve de cette étroite proximité.

À l'heure où l'étude de l'Égypte hellénistique et romaine connaît un renouveau, l'occasion est donnée de faire le point sur cette documentation musicale afin de mesurer la part des héritages pharaoniques et le poids de la tradition gréco-romaine, épousant ainsi la problématique des imprégnations culturelles chère aux spécialistes de l'Égypte tardive. C'est l'objet d'une étude que je mène dans le cadre d'un programme de recherche proposé par l'IFAO au Caire<sup>8</sup> ; les pistes de recherche et les principales problématiques de ce travail en cours sont exposées ici.

## 1. Les figurines en terre cuite : une source privilégiée pour la connaissance de la vie musicale

D'ordinaire les recherches sur le musicien à Rome et dans l'empire romain s'orientent en priorité vers l'étude des tombeaux et l'examen des inscriptions funéraires ou agonistiques, mais l'Égypte offre sur ce point très peu de

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gréco-romaine) et de les rattacher à l'époque romaine. Le cas du luth trouvé par A. Gayet dans la tombe d'une femme à Antinoé en Moyenne Égypte est également emblématique : cet instrument à cordes que l'on croyait romain (III<sup>e</sup> s. p. C.) a été daté dernièrement de l'époque byzantine (VI<sup>e</sup> ou VII<sup>e</sup> s. p. C.) grâce à des méthodes scientifiques (carbone 14, analyse des bois et des vêtements de la défunte) : cf. Calament, Eichmann et Vendries 2012.

<sup>6</sup> L'étude des nains musiciens et danseurs de l'épave de Mahdia, dont l'origine alexandrine est attestée, offre des rapprochements saisissants (postures, attributs) avec les représentations de nains danseurs dans la coroplastie. Voir en particulier l'étude de Wrede 1988, qui insiste sur la connotation dionysiaque des personnages.

<sup>7</sup> Kessler et Brose 2008, 23 (plan de la tombe), 41 pour l'ensemble du mobilier, 54-5 pour le détail des aulètes.

<sup>8</sup> Ce programme a été initié par S. Emerit (IFAO, Le Caire) spécialiste de la musique pharaonique : il s'intitule *La musique égyptienne ancienne et sa postérité dans l'Égypte moderne : continuités et ruptures*. La publication, à paraître aux presses de l'IFAO, sera une monographie sur les musiciens dans la coroplastie : *Musiciens de l'Égypte gréco-romaine. Les terres cuites figurées*.

parallèles<sup>9</sup>. Fort heureusement, cette faiblesse documentaire est largement compensée par l'abondance de la papyrologie et par l'originalité des terres cuites. À partir du début du XX<sup>e</sup> siècle, les achats massifs de figurines par les voyageurs et savants auprès des *fellahs* et des marchands permettent la constitution des premières collections de terres cuites dites 'du Fayoum' dans les musées européens (Copenhague, Berlin). À titre d'exemple, la collection de C. M. Kaufmann, résultat de collectes effectuées en 1911-1912 dans le Fayoum (le nome arsinoïte), a permis de réunir 800 terres cuites conservées aujourd'hui à Francfort (Pl. IX 1a)<sup>10</sup>. La documentation est importante et peut se mesurer à l'aune des deux plus grandes collections restées en Égypte : celle du Musée gréco-romain d'Alexandrie – aujourd'hui inaccessible<sup>11</sup> – et celle du Musée égyptien du Caire<sup>12</sup> et si le pourcentage des musiciens n'est pas très élevé par rapport à l'ensemble du corpus, il n'en reste pas moins vrai qu'ils sont bien visibles. Malheureusement cette documentation présente un lourd handicap lié à l'absence de contexte et de datation. Il est regrettable que les catalogues des grandes collections ne puissent indiquer l'origine exacte et établir la chronologie de ce type d'objet et que l'on en soit encore réduit à dater en fonction de critères techniques (couleur des argiles) et stylistiques (vêtements et coiffures)<sup>13</sup>. Ainsi la femme assise jambes croisées, dans la posture traditionnelle des orantes, et tenant des crotales à disques, porte la coiffure en côtes de melon mise à la mode sous l'impératrice Iulia Domna au début du III<sup>e</sup> s. p. C.<sup>14</sup> (Fig. 1).

La vague formule autrefois usuelle – 'époque gréco-romaine' – tend à disparaître au profit de datations bien plus précises. Malgré les progrès, il reste encore bien des incertitudes illustrées par les débats récents entre spécialistes<sup>15</sup>.

<sup>9</sup> Aucune statue agonistique n'a été trouvée en Égypte et les tombeaux de musiciens sont rarissimes.

<sup>10</sup> Bayer-Niemeyer 1988, 9.

<sup>11</sup> Il faut consulter les ouvrages de Breccia 1930-34.

<sup>12</sup> La salle 32 du musée abrite une sélection de pièces de la collection dont la présentation est en cours de remaniements. Il n'existe pas de catalogue des figurines.

<sup>13</sup> On pourra mesurer les progrès de la datation en comparant le catalogue de van Wijngaarden 1958, dont les notices ne sont pas accompagnées d'éléments de datation, et ceux bien plus récents de Bayer-Niemeyer 1988 ou de Fischer 1994, qui proposent des datations précises et argumentées.

<sup>14</sup> Fjeldhagen 1995, no. 106. Ce type de crotales en métal est bien attesté par les vestiges archéologiques : Anderson 1976, no's 27-8.

<sup>15</sup> Voir les réserves de Nachtergaele 1995 à propos des datations proposées dans le catalogue de la collection du Louvre par Dunand 1990 ; Bailey 2008, 3-5, propose de réviser certaines datations considérées comme acquises et de rattacher certaines terres cuites considérées comme romaines à l'époque ptolémaïque.



Figure 1. Femme aux crotales. Ny Carlsberg Glyptotek, Copenhague, inv. Æ. I. N. 512. H. : 11, 3 cm. Achetée en Égypte en 1892 par V. Schmidt. D'après H. Hickmann, « Cymbales et crotales dans l'Égypte ancienne », *ASAE*, 49, 1949, fig. 54.

Seule une faible partie des terres cuites conservées dans les musées ont une origine clairement établie et lorsque l'on connaît les circonstances de la découverte, on note alors que ces figurines ont pour la plupart été trouvées dans les tombes ou les maisons<sup>16</sup> alors que les dépôts dans les temples sont moins bien documentés. Nous avons affaire à des objets de faible prix destinés à une large diffusion, et dont l'achat ne répond pas a priori à des considérations esthétiques ; ce ne sont pas des œuvres d'art que l'on collectionne dans sa maison comme les statuettes modelées en terre cuite dans la France du XVIII<sup>e</sup> s. qui étaient signées par de grands artistes. Dans l'antiquité, la petite plastique ne jouit pas du statut de la grande sculpture : les modernes parlent alors de 'bibelots' – une expression ambiguë – ou 'd'œuvrettes sans prétention'<sup>17</sup>. Les figurines sont fabriquées en série par des artisans anonymes à partir des différents ateliers attestés à Alexandrie, dans le delta et la vallée du Nil (Memphis, Edfou, Coptos) et permettent d'écrire un chapitre de l'art provincial. Ce mobilier en

<sup>16</sup> Dunand 1979, 8-9 ; Nachtergaele 1985, 233-9, dresse l'inventaire des découvertes à partir des rapports de fouilles.

<sup>17</sup> Nachtergaele 1988, 5.



terre cuite comprend des plaques (sans doute à usage votif), des lampes plastiques et surtout des figurines de petit format (entre 8 et 30 cm au maximum) moulées dans des moules bivalves et qui étaient ensuite peintes. Elles sont creuses et seule la face avant est travaillée tandis que le dos est lisse en règle générale et il arrive que les coroplastes après démoulage fassent des retouches et tracent certains détails avec l'ébauchoir. En tout cas, on ne moule jamais les instruments de musique à part comme on le fait avec la cithare ou le tympanon dans la coroplastie grecque qui sont ensuite rapportés dans les bras du musicien<sup>18</sup>: dans les ateliers égyptiens, tous les instruments de musique sont moulés dans la masse. D'ailleurs il n'existe pas de modèles réduits d'instruments de musique comme on en rencontre quelquefois en Méditerranée<sup>19</sup>: quelques objets ont parfois été moulés (des autels miniatures, des couteaux de sacrifice), mais en Égypte on ne trouve jamais une lyre ou une cithare. La seule exception concerne des trompes en terre cuite (entre 15 et 20 cm) provenant de Boubastis dans le delta qui copient les modèles des véritables trompes militaires et qui semblent correspondre à des dépôts votifs<sup>20</sup>.

Par rapport aux autres grands centres de production du monde grec (Béotie, Tanagra, Smyrne), la singularité du répertoire égyptien s'impose comme une évidence dans la mesure où la production acquiert une réelle originalité lorsqu'elle s'éloigne des canons traditionnels de la sculpture grecque. À Alexandrie la fabrication des tanagréennes, copiées sur les modèles béotiens et attiques, cesse vers la fin du III<sup>e</sup> s<sup>21</sup>. pour céder progressivement la place à des sujets gréco-égyptiens qui s'inspirent désormais du milieu indigène (avec types égyptisants et sujets réalistes). À la fin de l'époque hellénistique et à l'époque impériale les officines acquièrent une réelle personnalité avec des créations composites où les références locales se multiplient. Parmi les éléments qui permettent de donner une couleur locale on relève le sphinx, le palmier, le prêtre au crâne rasé et au manteau de lin, le type ethnique de l'Éthiopien, les autels à cornes, les barques, les singes. C'est le moment où les motifs se diffusent également dans le Fayoum et la vallée du Nil. Il ne faudrait pas croire qu'Alexandrie se réserve les sujets grecs et que la *chôra* ne traite que ceux en rapport avec la culture indigène car la réalité est plus complexe et

<sup>18</sup> Hamdorf, Brinkmann et Koppermann 1996, no. 146 (Centuripe, Apulie, vers 150 a. C. : Muse à la cithare).

<sup>19</sup> Voir par exemple D'Amicis 1998, no. 9 : modèles de cithare en terre cuite trouvés dans une tombe à Tarente, II<sup>e</sup> s. a. C.

<sup>20</sup> Conservées au musée égyptien du Caire : inv. JE 43861 : 19 cm., Hickmann 1949, no. 69852, voir aussi les autres modèles présentés dans Török 1995, no. 307 (16, 5 cm), pl. 166 : prov. inconnue et dans Bailey 2008, no's 3304 et 3305 (Naukratis).

<sup>21</sup> Kassab Tezgör 2007.

certaines figurines sorties des ateliers de la capitale illustrent les faits les plus marquants de la religion traditionnelle<sup>22</sup>. Beaucoup de types créés à l'époque hellénistique se maintiennent à l'époque romaine cependant il faut compter avec quelques types nouveaux comme le joueur de syrinx ou l'aulète assis près d'une amphore pour ne parler que des musiciens.

En dépit d'une certaine réticence liée autrefois à des jugements d'ordre esthétique (on allait jusqu'à écrire que les terres cuites du Fayoum étaient 'horribles' par contraste avec les tanagréennes d'Alexandrie), l'importance de ces documents iconographiques a été assez vite cernée pour la connaissance de la religion populaire et l'ouvrage de P. Perdrizet en 1921 sur *Les terres cuites grecques d'Égypte de la collection Fouquet* en témoigne largement. Toutefois, il a fallu attendre la parution de l'étude de Fr. Dunand en 1979 (*Religion populaire en Égypte romaine. Les terres cuites isiaques du Musée du Caire*) pour attirer l'attention sur ce type de mobilier. Le corpus, au sein duquel les musiciens trouvent toute leur place surtout parmi les auxiliaires du culte, se structure autour des thèmes liés à la prospérité, la fécondité, la protection, l'enfance, la sexualité. Ces petits objets de piété sont la manifestation de croyances populaires. Il faut donc s'efforcer non seulement d'en dresser la typologie et la chronologie, mais aussi d'en retrouver les codes de lecture afin de comprendre leur valeur symbolique. Depuis vingt ans les travaux scientifiques se multiplient sur la coroplastie (à propos des ateliers, des techniques de fabrication, mais aussi avec un questionnement sur leur signification sociale et religieuse) et désormais la petite plastique en terre cuite bénéficie d'un intérêt accru et sa connaissance s'en trouve approfondie<sup>23</sup>.

## 2. Un répertoire en connexion avec le thème des fêtes

Le thème du théâtre et le monde des acteurs, bien ancré dans le répertoire de la coroplastie grecque, a été mis en valeur à partir de l'exemple de l'Italie du sud<sup>24</sup>. Sans connaître une richesse comparable, le corpus égyptien fait aussi la part belle aux représentations scéniques (masques, acteurs de pantomime et de mime)<sup>25</sup>. Dans le domaine plus spécifique de la musique, quelques études

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<sup>22</sup> Ballet 1998, 228, à propos d'un prêtre aulète (MGR Alexandrie, inv. 20301).

<sup>23</sup> On trouvera un état des lieux dressé Hornbostel et Laubscher 1985, s.v. Terrakotten, coll. 425-56.

<sup>24</sup> Brea 1981 et 2001.

<sup>25</sup> Ces derniers sont toutefois difficiles à identifier dans le corpus car les critères d'identification des mimes ne sont pas clairs, mais cette remarque est valable pour l'ensemble de l'iconographie hellénistique et romaine.

ont été menées récemment sur les terres cuites de musiciens de l'époque hellénistique avec de belles illustrations trouvées en Asie centrale<sup>26</sup>, à Suse<sup>27</sup> et en Sicile<sup>28</sup> grâce aux découvertes provenant du sanctuaire de Fontana Calda. Plusieurs expositions consacrées à l'Égypte ptolémaïque et romaine ou aux terres cuites gréco-égyptiennes<sup>29</sup> ont contribué également à vulgariser quelques-unes de ces figurines mais, à ce jour, il n'existe pas de monographie sur les musiciens dans la coroplastie.

Certaines figures de musiciennes qui sont des personnages clefs du répertoire en Égypte nous sont familières à travers d'autres traditions coroplastiques de la Méditerranée ; c'est le cas de la joueuse de tambourin ou de la harpiste présentes autant à Chypre, au Proche-Orient qu'en Grèce propre. Si le thème des musiciens est bien connu dans la terre cuite grecque de façon générale (en Attique, en Béotie, en Asie mineure ou en Italie du sud), en Égypte il s'inscrit étroitement dans le cadre des fêtes et de leurs prolongements « profanes » avec banquets, jeux et spectacles. Ces fêtes répétées qui rythmaient le calendrier nécessitaient à la fois des porteurs de statues divines, des servants du culte, des orants, des autels, des animaux à sacrifier, du vin à consommer, des portefaix pour les victuailles, des musiciens et des danseurs : tout un monde que l'on trouve réuni dans le répertoire de la coroplastie<sup>30</sup>. Le corpus est organisé à partir de quelques figures emblématiques divines (Harpocrate domine largement suivi par Isis) autour desquelles gravitent des personnages périphériques. Dans leur immense majorité les musiciens sont apparentés à la religion à l'instar des autres personnages du corpus<sup>31</sup>. Plusieurs marqueurs de la fête permettent d'inscrire le musicien dans la sphère religieuse : le port de couronnes alvéolées et de guirlandes, la présence sur le côté de la tête de la mèche de l'enfance empruntée à Harpocrate, le nœud isiaque sur le manteau des femmes, l'amphore vinaire (pour les libations) ou le pot à eau du Nil, le sexe énorme dressé contre le mauvais œil ; autant de signes qui donnent une unité au répertoire et qui servent de signes de reconnaissance pour le spectateur.

<sup>26</sup> Meshkeris 1996.

<sup>27</sup> Martinez-Sève 2002 : le catalogue contient toute une série de musiciens (harpistes, tambourinistes, aulètes).

<sup>28</sup> Bellia 2008.

<sup>29</sup> La seule exposition consacrée entièrement à la coroplastie égyptienne s'est tenue à Hambourg : Ewigleben et von Grumbkow 1991.

<sup>30</sup> Cette idée d'une unité du répertoire, déjà avancée par Perdrizet en 1921, est largement développée dans les travaux de Nachtergaele.

<sup>31</sup> Il y a bien entendu des exceptions : Les Éros joueurs de trompettes, qui apparaissent au III<sup>e</sup> s. a. C. sur les alabastres alexandrins, sont un écho des guerres menées par les Ptolémées contre les Galates.

Le traitement des personnages se fait dans la tradition de la coroplathie grecque (le style n'a donc rien à voir avec les reliefs des temples égyptiens sauf pour la représentation de Bès, ce génie familial, qui conserve ses traits hérités de l'art pharaonique (Pl. IX 1b.)). Les procédés utilisés donnent à ces images un aspect très éloigné des canons de l'art classique si l'on fait exception de quelques figurines empruntées à la grande sculpture (Eros et Psyché, Hercule...). M.L. Allen a bien résumé la nature de ce style 'romano-égyptien' à propos des terres cuites trouvées à Karanis dans le Fayoum, émanation des goûts d'une population rurale et expression d'une esthétique indigène : "the preference for frontality, the perception of form as mass in repose and equilibrium, a tendency toward volumetric abstraction, fondness for surface detail, and complex iconographic and symbolic content."<sup>32</sup>

### 3. Des séries sur les musiciens : harpistes, tambourinistes et aulètes

Quel intérêt le spécialiste de la musique peut-il en tirer? Dans quelle mesure ces objets figurés recourent-ils les informations livrées par les textes et les papyrus? Nous aident-ils à mesurer la popularité des musiciens? Pour appréhender la vie musicale plusieurs facteurs sont à prendre en considération : de fortes traditions musicales héritées de la civilisation pharaonique bien ancrées dans la vie religieuse (le poids de la harpe et des percussions notamment), un goût marqué pour les spectacles, la prégnance de la musique et des thématiques dionysiaques chez les rois Ptolémées, un enrichissement lié à l'apport grec et romain avec de nouvelles disciplines scéniques (mime, pantomime, concours) et de nouveaux instruments.

L'importance donnée aux musiciens dans le corpus recoupe les informations dont on dispose sur les cérémonies religieuses et les fêtes dans l'Égypte tardive (processions, sacrifices, banquets)<sup>33</sup>. Depuis longtemps la musique est associée au thème de la joie et des plaisirs dans la tradition égyptienne qu'il s'agisse des fêtes de la crue ou de celles qui célèbrent le retour de la déesse lointaine et ce sujet est largement exposé dans les temples tardifs comme à Denderah ou Philae. Cependant peu de divinités locales ont un instrument de musique pour attribut : il y a bien entendu Isis et son sistre mais le plus représentatif est Bès tantôt harpiste (Pl. IX 1b) ou trompettiste lorsqu'il se militarise à l'époque

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<sup>32</sup> Allen, 1993 ; pour plus de détails Allen 1985, 81-6, 101-3, qui étudie la notion de mixité et d'hybridation.

<sup>33</sup> Bonneau 1964 ; Perpillou-Thomas 1993 et 1995.



Figure 2. Trois versions de la canéphore. D'après Schreiber, 1908, fig. 162 a-b-c : avec joueur d'*aulos* traversier (Berlin, Neues Museum, inv. 8038, H. 19,4 cm, milieu du II<sup>e</sup> s. p. C.), avec joueur d'*aulos* double (Londres, British Museum, inv. GR 1926.9-30.35, H. 22,3 cm., II<sup>e</sup> s. p. C.), sans musicien (Alexandrie).

romaine ; il y aussi Harpocrate qui, en de rares occasions, se fait aulète ou cithariste ou la pseudo-Baubô, déesse de la fécondité ou femme en couches, montrée nue et jambes écartées, à qui l'on donne le sistre, la harpe ou la cithare au lieu du miroir ou du pot à eau (Pl. IX 1c). Et parfois l'on découvre des choses étonnantes comme cette Isis/Nikè de Naukratis, montée à cheval et affublée, elle aussi, d'une harpe<sup>34</sup>. Comme ailleurs la difficulté consiste à identifier clairement les divinités : devant l'image de femmes qui portent des attributs divins, faut-il d'emblée parler de divinités ou y voir de simples mortelles<sup>35</sup>? Ainsi le type de la canéphore nue accompagnée d'un petit aulète (enfant ou esclave?) debout contre sa jambe droite est inconnu dans la coroplastie grecque et les discussions vont bon train sur l'identité de ce personnage féminin avec son panier rempli d'offrandes posé sur sa tête.

<sup>34</sup> Bailey 2008, no. 3011 et p. 10 : (III<sup>e</sup> ou II<sup>e</sup> a C.) : "the significance of this group is, to me, obscure".

<sup>35</sup> Ce questionnement est valable pour la coroplastie du monde grec : cf. Huyscom-Haxhi et Muller 2007 : les auteurs s'efforcent de proposer des critères d'identification.

Après y avoir vu une 'pleureuse' apportant des fruits pour la nourriture du mort (Schreiber<sup>36</sup>) ou une divinité chtonienne (Weber)<sup>37</sup>, les savants hésitent désormais entre une déesse de la fécondité (Aphrodite-Hathor?)<sup>38</sup> ou une simple canéphore inspirée par celles qui participaient aux fêtes ptolémaïques<sup>39</sup>.

Dans le corpus, les musiciens les plus nombreux sont des servants du culte mais à quelle catégorie précise faut-il les rattacher? La plupart des figurines de femmes au tambourin ont été d'emblée cataloguées comme des 'prêtresses d'Isis'<sup>40</sup> mais pourraient n'être que des dévotes. L'enjeu consiste à replacer chaque figure individuelle dans un ensemble cohérent et, sur ce point, les parallèles avec les scènes de procession figurées sur les *mammisi* apportent des éléments de réponse; c'est le cas des peintures de Kellis dans l'oasis de Dakhla avec un harpiste au crâne rasé jouant d'une grande harpe à seize cordes pour les divinités locales<sup>41</sup> ou des reliefs des colonnes du temple d'Hathor à Philae avec des prêtres musiciens, aulètes et citharistes<sup>42</sup>. En Italie même, certains documents montrent des scènes que nous ne connaissons pas dans l'art égyptien: des peintures isiaques d'Herculanum montrent les cérémonies au pied des temples avec les musiciens au milieu des dévots et il est frappant de constater sur l'une d'elle<sup>43</sup>, au sommet de l'escalier du temple, la présence de la tambouriniste et de l'aulète qui encadrent un danseur dont la posture est exactement semblable à celle adoptée par Bès dansant (Pl. IX 3c) ou par les autres danseurs dans la coroplatie: un bras plié et main posée sur la hanche et l'autre avec la main à hauteur de la tête. Les sources littéraires contribuent également à cette reconstruction: la fameuse description de la procession isiaque par Apulée au livre XI des *Métamorphoses* offre un tableau saisissant de l'environnement musical avec les flûtes de Pan ou les *auloi* (*fistulae tibiaeque*) qui accompagnent le chant des choristes; l'information la plus originale

<sup>36</sup> Les premières figurines de ce type ont été découvertes dans l'une des nécropoles de l'Alexandrie: Schreiber 1908.

<sup>37</sup> Weber 1914, 127.

<sup>38</sup> Voir la mise au point dans Nachtergaele 1995, 273.

<sup>39</sup> Des canéphores assistent les prêtres instaurés pour célébrer le culte officiel d'Arsinoé Philadelphie car une *kanéphoros* est mentionnée lors des fêtes données pour Arsinoé dans le décret de Canope: Bernand 1970, 990 (l.3), 993.

<sup>40</sup> Cf. le catalogue des tambourinistes dressé dans Dunand 1979; 1990, no's 522-31.

<sup>41</sup> Kaper 1997, fig. 52, pour le harpiste; commentaire 129-30 et 132; datation: première moitié du II<sup>e</sup> s. p. C.?

<sup>42</sup> Daumas 1969, pl. I-II et IV; l'auteur pense (17) que les figures de singe luthiste et de Bès harpiste renvoient au travestissement des prêtres en singe ou en Bès.

<sup>43</sup> Naples, Musée arch. Nazionale, inv. 8919. Cf. Tran Tam Tinh 1971, fig. 41, pp. 39-41, 47-8, 85-6; détail du danseur dans Bonneau 1964, pl. IVa; Merkelbach 2001, fig. 73.



tient à l'évocation du joueur de flûte traversière (*obliquus calamus*), 'consacré au grand Sarapis'<sup>44</sup>, dont on a plusieurs illustrations dans le corpus des terres cuites (Pl. IX 2a)<sup>45</sup>. De façon générale, on aurait sans doute beaucoup à gagner à explorer davantage les textes, littéraires ou papyrologiques, afin de chercher une origine à certaines de nos figurines. Ainsi, le motif du serviteur noir porteur de lanterne, popularisé dans la coroplathie, a-t-il été mis en relation avec un esclave de la cour d'Apollonios, ministre de Ptolémée II, évoqué dans les lettres de Zénon au III<sup>e</sup> s. a. C<sup>46</sup>.

Dans le répertoire des figurines, le procédé du moulage et de la duplication contribue à donner parfois l'impression d'une répétition des motifs – F. Dunand parle de "monotonie" – et cela est vrai aussi pour les figures de musiciens. La plupart des différents types d'instruments de musique connus dans le monde hellénistique et romain sont représentés à travers le corpus cependant plusieurs figures de musiciens ont tendance à écraser par leur omniprésence la place des autres instrumentistes ; c'est le cas des harpistes, des tambourinistes ou des aulètes, mais l'impression apparente de répétition ne doit pas nous empêcher de saisir les variantes d'une figurine à l'autre.

La harpe angulaire (le *trigonon*) est sans conteste un héritage de la tradition musicale pharaonique car elle est utilisée sans discontinuité depuis l'Ancien Empire jusqu'à l'époque romaine, mais elle est aussi connue dans le monde grec depuis le IV<sup>e</sup> s. a. C. Le type de la harpiste assise ou debout vêtue d'un *chiton* est attesté de façon précoce dès le III<sup>e</sup> s. a. C. dans la production des tanagréennes d'Alexandrie (Pl. IX 2b)<sup>47</sup>. Dès le II<sup>e</sup> s. a. C., des types plus conformes aux habitudes locales montrent désormais un homme, un porteur de palanches chargé de victuailles, au visage grotesque, qui transporte la harpe trigone, suspendue à la main ou portée sur l'épaule, qui, à elle seule, devient un marqueur de la fête<sup>48</sup>. Lorsqu'elle est jouée, la harpe est toujours disposée de façon conventionnelle dans le prolongement du corps de l'instrumentiste et non pas en position perpendiculaire comme le voudrait la réalité du jeu car le respect de cette position aurait pour effet d'obliger le coroplathe à utiliser un moule supplémentaire pour mouler la harpe en relief sur le devant de la figurine.

<sup>44</sup> Apulée, *Métamorphoses*, XI, 9. Commentaire dans Griffiths 1971.

<sup>45</sup> Pour les joueurs de *plagiaulos* (d'*aulos* traversier) : Hickmann 1961, 113, no's 76-8.

<sup>46</sup> Plusieurs papyrus évoquent la présence à la cour de Ptolémée II Philadelphie d'un esclave noir 'porteur de lanterne' : cf. Mossakowska 1992, fig. 6-7, pour les terres cuites.

<sup>47</sup> Kassab Tezgör 2007, no's 16, 216 : dernier quart du III<sup>e</sup> s. ou début II<sup>e</sup> s. a. C., pour les femmes harpistes, tanagréennes et post tanagréennes, pp. 213-14.

<sup>48</sup> Bel exemple dans Perdrizet 1921, no. 313, pl. CVI (Moyenne Egypte) ; I<sup>er</sup> s. a. C.?

Le motif du tambouriniste (la *tympanistria*) ne se décline qu'au féminin : ces femmes sont montrées immobiles, couronnées, ornées de bijoux et vêtues du manteau isiaque et constituent à elles seules une série très importante (Pl. IX 2c). Ce type apparaît au I<sup>er</sup> s. a. C. et se perpétue jusqu'au III<sup>e</sup> s. p. C. avec de nombreux surmoulages. La typologie est assez uniforme en apparence mais présente en réalité bien des variations en fonction du traitement de la parure (coiffure, vêtement), de la gestuelle (une jambe en avant<sup>49</sup>, un léger décalage du corps de trois quarts)<sup>50</sup>, de la disposition du tambourin (porté, soulevé ou frappé avec la paume de la main droite), de la distribution des objets placés aux pieds du personnage que l'on peut supprimer ou déplacer (c'est le cas avec l'amphore). Le *tympanon* est toujours de petite taille par rapport à celui que tient la tympaniste dans la coroplathie grecque d'Italie du sud<sup>51</sup>. L'importance de ce motif dans le corpus est telle qu'on ne peut nier la valeur attachée à cette image du tambourin qui, à elle seule, semble résumer le moment de la procession et de la fête isiaque.

La variété des aulètes tranche avec l'uniformité apparente de la tambouriniste. Les coroplathes déclinent différents types d'aulètes et intègrent les particularités locales en introduisant notamment aux côtés de l'*aulos* double le *monaulos*<sup>52</sup> et surtout l'*aulos* transversal (le *plagiaulos* nommé *photinx* chez les Égyptiens<sup>53</sup> et qu'Apulée essaye de rendre en latin par *obliquus calamus*) présentés dans le récit d'Athénée comme des instruments à vent typiquement alexandrins<sup>54</sup>. L'aulète assis auprès d'une amphore est également un type très populaire au I<sup>er</sup> s. p. C. Il est montré de façon quasi immuable couronné avec les boutons de lotus – une coiffure à connotation harpocratique – la tête penchée vers l'avant avec les joues gonflées par l'insufflation des deux tuyaux de l'*aulos*<sup>55</sup> car jamais les aulètes ne sont montrés avec la *phorbeia*, cette lanière disposée autour du visage. La documentation réserve parfois des surprises. D'une part, l'abondance des joueurs de syrx (les *suristai*) étonne (Pl. IX 2d) car ce personnage n'est pas en relation avec le thème du berger ou avec Attis ;

<sup>49</sup> Dunand, 1990, no. 526.

<sup>50</sup> Nachtergaele 1988, no. 35.

<sup>51</sup> Le tambourin est non seulement très important – parfois son diamètre est au moins deux fois plus grand – mais il est tenu de façon différente, suspendu par la main gauche vers le sol.

<sup>52</sup> Voir la terre cuite du prêtre aulète signalée à la note 22 : le personnage souffle dans un seul tuyau.

<sup>53</sup> Juba d'après Athénée, IV, 78.

<sup>54</sup> Voir les réserves de Barker 2000 sur ce passage d'Athénée (IV, 174 a-185 a) consacré à la musique égyptienne.

<sup>55</sup> On trouve ce personnage dans presque toutes les collections : Dunand, 1990 no. 541 ; Török 1995, no. 150.

sa présence répétée pourrait s'expliquer par le rôle religieux qui lui était dévolu et que relate le papyrus du *Gnomon de l'Idiologue* (II<sup>e</sup> s. p. C.) dans le paragraphe concernant les obligations sacerdotales (*BGU*, V, 1210, 75). D'autre part, on note l'extrême rareté des cymbales, de la lyre ou du luth (à l'époque romaine en tout cas) et celle, encore plus surprenante, de l'orgue hydraulique (*hydraulis*) pourtant inventé à Alexandrie sous Ptolémée II Philadelphie. À ce jour, le seul document connu montre une organiste accompagnée d'un nain soufflant dans une longue trompette droite (Pl. IX 3a)<sup>56</sup>. C'est une scène que l'on propose de rattacher au mime<sup>57</sup>, mais qui semble renvoyer à un couple de musiciens bien connu dans l'iconographie de l'amphithéâtre : le *salpistes* et l'*hydraules*. La présence remarquée du nain, sorte de porte-bonheur, se répète sur nombre de terres cuites et de figurines en bronze où il est montré dans l'exercice de la danse ou de la musique car nulle part ailleurs qu'en Égypte le nain ne semble occuper un rôle aussi marqué dans l'iconographie des terres cuites et en particulier chez les musiciens et les danseurs<sup>58</sup>. Parmi les autres singularités du répertoire, la part accordée au traitement caricatural ne laisse pas indifférent : bien des visages grimaçants sont traités à la façon des 'grotesques' ou selon les caractéristiques de la tête dite 'de l'esclave'<sup>59</sup> et les musiciens n'échappent pas à la règle. L'hypothèse selon laquelle la caricature serait la traduction du mépris des classes supérieures pour le monde paysan et rural n'est guère recevable et il faudrait sans doute approfondir l'influence du monde du théâtre et la valeur apotropaïque de ces figurines pour proposer d'autres explications. Il est surtout frappant de constater qu'un même personnage peut être montré tantôt sous des traits 'normaux', tantôt transformé par le jeu de la caricature : le joueur de flûte de Pan en est par exemple l'illustration et il faut croire alors que la signification de la terre cuite s'en trouve transformée. Au-delà des séries se pose la question des pièces uniques car il y en a quelques-unes (comme la figurine de l'organiste et du nain à la trompette évoquée plus haut) or, a priori, la notion d'*unicum* est étrangère au principe même de la coroplathie car le procédé du moulage laisse supposer la fabrication d'autres types similaires qui auraient été perdus.

<sup>56</sup> Musée du Louvre, anc. Coll. Gréau. Inv. CA 426. H. 13 cm : Perrot 1965, 109-10, pl. V, Besques 1992 ; D/E 4517 : I<sup>er</sup> s. a. C. ; Markovits 2003, 76, la date du I<sup>er</sup> s. p. C.

<sup>57</sup> Wooton 2004, 249, fig. 3.

<sup>58</sup> Voir l'étude à paraître de Dasen, sous presse.

<sup>59</sup> Sur l'importance de ce thème et sur le flou qui règne dans les définitions des mots 'caricature' et 'grotesque', Fischer 1994, 51-4.

#### 4. Quelques éléments d'interprétation

Lorsque l'on fait le bilan du corpus, on est amené à constater la rareté des figurines qui s'inspirent de la tradition grecque tant le poids des thématiques indigènes semble l'emporter. Il y a peu de dieux ou de héros grecs musiciens mis en scène dans la coroplathie : pas d'Orphée ou de Muses, rien sur Marsyas ; Apollon à la lyre est assez discret mais Éros, qui se fait parfois musicien, tient une place non négligeable sans doute en raison de sa connotation funéraire. En outre, parmi les instrumentistes, on pointe l'absence des aulètes en habit de concours et l'on ne recense que très peu de citharôdes alors qu'il y avait des concours de type grec en Égypte à l'époque ptolémaïque et romaine<sup>60</sup>. Néanmoins, il ne faut pas oublier l'importance dans le répertoire des thèmes dionysiaques avec les personnages du thiasse (Silène, Priape) comme l'ont montré les fouilles de l'atelier d'Athribis dans le delta et cela a forcément un rapport avec les goûts prônés par les rois lagides<sup>61</sup> ; ainsi la fréquence des thèmes dionysiaques pourrait expliquer la popularité du tympanon, de l'*aulos* ou de la syrinx. Le silène trompettiste conservé à Amsterdam en est un bon exemple (Pl. IX 3b) : vêtu d'une chlamyde, il souffle dans une longue trompe droite, la *salpinx*, et il y a fort à parier que ce motif s'inspire du *salpistès* qui marchait lors de la célèbre procession donnée à Alexandrie sous Ptolémée II Philadelph<sup>62</sup>.

Plusieurs catalogues (comme celui de L. Török pour le musée de Budapest<sup>63</sup>) ou articles récents (ceux de G. Nachtergaele en particulier<sup>64</sup>) mettent l'accent sur l'interprétation de ces figurines replacées dans leur contexte religieux et la place de la musique participe de cette réflexion sur le monde de la fête. Difficile de dire cependant à quel type de divinité se rattache tel ou tel musicien car les coroplathes privilégient les indices qui orientent vers la sphère d'Isis et d'Harpocrate alors que l'on sait que les musiciens intervenaient dans d'autres cultes. C'est là le reflet des déséquilibres observés dans le corpus où les images d'Harpocrate, d'Isis puis de Bès prédominent largement au détriment d'Osiris, de Sérapis ou Zeus. On ne saurait dire non plus si les musiciens et les autres personnages montrés dans les terres cuites sont l'illustration d'une fête précise

<sup>60</sup> Les concours en Égypte sont malheureusement mal connus ; ils sont attestés jusqu'au III<sup>e</sup> s. p. C. ; les musiciens des concours les mieux connus sont les trompettistes (les *salpistai*) : voir la prosopographie dans Perpillou-Thomas 1995.

<sup>61</sup> Szymanska 1998 et 2005.

<sup>62</sup> Athénée 198a d'après Callixenos de Rhodes. Texte cité dans Bernand 1998, 335. Voir le commentaire de Rice 1983, 8-9, 49.

<sup>63</sup> Török 1995.

<sup>64</sup> Nachtergaele 1988, 1995.

parce que les coroplastes reproduisent les mêmes types sur plusieurs générations, ce qui leur confère une sorte de valeur générique.

L'examen des figurines permet de prendre la mesure de la popularité de tel ou tel instrument de musique, de saisir les continuités et les ruptures des traditions musicales (entre l'époque pharaonique et l'Égypte tardive ou entre la période ptolémaïque et l'époque romaine), de suivre l'intégration des nouveaux instruments apportés par les Grecs et les Romains. Il convient en premier lieu d'identifier correctement les instruments de musique figurés et l'on constate à ce propos que les coroplastes montrent parfois des détails qui témoignent d'un grand sens de l'observation (chevilles des cithares alignées sur le joug, anches des *auloi*, décor de la membrane du tambourin, différentes parties emboîtées de la trompette ou de l'*aulos*), mais dans l'ensemble la technique du moulage et le format réduit invitait le coroplaste à la schématisation des objets et des attributs : ainsi les *auloi* ne présentent jamais de traces de mécanismes. Pire encore, les surmoulages ont pour conséquence d'altérer les reliefs qui apparaissent alors usés et difficiles à lire. Quant au nombre de cordes tracées pour les cithares ou les harpes (peintes ou incisées), il va sans dire qu'il n'est qu'approximatif. C'est pourquoi on ne peut faire dire à ces figurines davantage que ce qu'elles donnent à voir : ainsi il est illusoire de vouloir reconstituer certains instruments de musique à partir de cette seule iconographie<sup>65</sup> car cela revient à ignorer les conventions qui président à son élaboration (petit format, schématisation des objets). Malgré les contraintes inhérentes à ce type de support, les instruments de musique sont en règle générale bien identifiables et seul le dossier de la cornemuse fait toujours débat parce que les outres dotées d'un tuyau qui accompagnent certains joueurs de syrinx ne comportent pas tous les éléments organologiques de la cornemuse. La célèbre figurine du *suristès* assis avec une outre sous le bras, conservée au musée de Berlin (Fig. 3)<sup>66</sup>, a attiré l'attention de bien des musicologues (C. Sachs, A. Baines, H. Hickmann, W. Bachmann), mais les gloses n'apportent à ce jour aucune solution qui emporte l'adhésion<sup>67</sup>. Alors que le mot *askaules* (joueur de cornemuse) existe

<sup>65</sup> C'est ce que propose sans convaincre Holmes 2008, 251 et fig. 28, pour la construction d'une trompette dite 'alexandrine' reconstituée grandeur nature à partir d'une terre cuite d'un joueur de trompette (Musée Allard Pierson à Amsterdam) et de celle d'un nain trompettiste (Musée du Louvre) : cf. pl. IX 3a.

<sup>66</sup> Weber 1914, no. 324, pl. 30 ; Philipp 1972, no. 41 ; Neues Museum Berlin, inv. 8798. H. 16, 2 cm.

<sup>67</sup> C. Sachs et H. Hickmann étaient persuadés que ce sac servait à alimenter en air la syrinx qui aurait été dotée d'anches comme une sorte d'automate à musique et que l'accessoire placé au pied du musicien était un soufflet destiné à alimenter le sac alors qu'il s'agit de *kroupezai*.



Figure 3. *Suristès* à la cornemuse (?) et nain cymbaliste. Terre cuite, Neues Museum Berlin, inv. 8798. H. 16, 2 cm. III<sup>e</sup> s. p. C. D'après A. Baines, *Bagpipes*, Oxford, fig. 35.

dans la papyrologie<sup>68</sup>, on cherche en vain l'image complète et incontestable d'une cornemuse dans l'art de l'Égypte tardive.

La terre cuite de Berlin associe deux musiciens (un *suristès* et un nain cymbaliste) ce qui n'est pas banal car la règle veut que les instrumentistes soient individualisés. Certes, il y a parfois sur la même figurine un musicien associé à une divinité ou à un personnage comme le petit aulète qui se tient debout aux pieds de la canéphore. Il existe aussi d'autres couples de musiciens : nous avons déjà rencontré un organiste et un trompettiste (Louvre) et la liste peut être complétée par un aulète et une cithariste (Petrie Museum, Londres<sup>69</sup>) ou un aulète et un danseur (Budapest :<sup>70</sup> Pl. IX 2a). La formule du trio relève de l'exception ;

<sup>68</sup> *PSA Athen.* 43 ; II<sup>e</sup> s. p. C., provenant du nome arsinoïte.

<sup>69</sup> Cliché dans Clarysse et Willems 2000, no. 256 (Petrie Museum, 33398).

<sup>70</sup> Török 1995, no. 151, II<sup>e</sup> s. a. C. ; H. : 9,9 cm.



on en connaît un sur une lampe de la collection Lawrence à Alexandrie qui montre trois musiciens couronnés et vêtus d'un *chiton*, jouant de la syrinx, de l'*aulos* double et de la cithare, assis sur une *klinè* en compagnie du dieu Bès qui danse à l'extrémité, rare moment où l'ensemble musical est mis en scène (Pl. IX 3c)<sup>71</sup>. La difficulté consiste à replacer les figurines isolées dans des ensembles, comme on le ferait avec les santons d'une crèche, et plus précisément dans des ensembles musicaux comme on en voit décrit dans les papyrus lors des fêtes données dans les villages du Fayoum où la crotaliste côtoie l'aulète et la tambouriniste la danseuse<sup>72</sup>. Les découvertes recensées dans les tombes ne font pas état de la présence dans une seule et même sépulture du dépôt d'un ensemble cohérent regroupant des musiciens et des danseurs car, à l'évidence, les musiciens étaient mélangés avec d'autres figurines de divinités, d'autres personnages ou des figures animales. Nous avons du mal à cerner ce qui présidait aux choix des figurines lors de la fabrication et de l'achat. En tout cas, il n'existait pas de type de musicien particulier qui aurait été réservé à la maison ou à la tombe : une même figurine peut être utilisée dans des contextes différents et sa signification doit alors être reconsidérée.

L'observation des terres cuites ne saurait se limiter au seul examen des instruments de musique. Parmi les objets d'étude, la répartition des spécialités musicales par sexe est à prendre en considération car certains instruments passent de la sphère féminine à la sphère masculine (la harpe) tandis que d'autres restent attachés à l'un des sexes : la trompette, bien entendu, et l'*aulos* pour les hommes alors que les femmes se réservent les crotales à disques ou le tambourin. Le costume, qui fournit des indices chronologiques, la coiffure (celle des tambourinistes est parfois très élaborée et semble réservée aux cérémonies du culte<sup>73</sup>) et la gestuelle sont également des éléments qui participent de l'histoire du genre et de l'histoire du corps. Parmi les traits marquants il faut compter avec cette habitude bien documentée en Égypte qui consiste à lier la musique et la danse<sup>74</sup>, ce qui explique que bien des figurines montrent les musiciens se déhancher ou esquisser un pas de danse (Pl. IX 2a et Pl. IX 2d). Pour certaines terres cuites la question de la grille de lecture est parfois posée lorsqu'il faut choisir entre une interprétation purement égyptienne ou grecque ou envisager la combinaison des deux traditions. Ce cas de figure est illustré par la figurine

<sup>71</sup> Schreiber 1908, fig. 167, description p. 234 : il y voit des musiciennes.

<sup>72</sup> Voir les ensembles musicaux qui accompagnent les danseurs dans Vesterinen 2007, 167-70 et 174-84, à partir des sources papyrologiques.

<sup>73</sup> Dunand 1979, 16, 24-6.

<sup>74</sup> Emerit 2011.

d'un âne à la lyre conservé dans les collections du musée du Louvre<sup>75</sup> et qui n'a, me semble-t-il, pas suscité l'attention qu'elle mérite. La figurine, datée sans doute du II<sup>e</sup> ou I<sup>er</sup> s. a. C. et probablement fabriquée dans les ateliers d'Alexandrie, montre un âne couronné jouant debout de la cithare posée sur son grand sexe (Pl. IX 3d). Le motif de l'âne qui joue de la lyre peut renvoyer à la tradition de l'âne harpiste bien connue dans les papyrus satiriques du Nouvel Empire (comme le fameux papyrus de Turin<sup>76</sup>) mais, à mon sens, il se fait ici l'écho du célèbre proverbe grec de l'âne à la lyre (*onos lyras*), utilisé pour désigner un personnage inculte et obtus, et qui était fort bien connu des Alexandrins<sup>77</sup>. Cette terre cuite illustre les rapports que pouvait entretenir la coroplastie avec la tradition parémiographique et pose la question du degré de culture du public qui achetait ce type d'objet : Grecs vivant dans la *chôra*, Égyptiens hellénisés ? La relation à la littérature n'est pas inexistante car plusieurs figurines avec des animaux pourraient illustrer fables ou proverbes. Ce qui montre que, selon la culture dominante du spectateur, la terre cuite était susceptible d'être lue de plusieurs façons : pour le spectateur égyptien, l'âne musicien peut évoquer la figure de l'âne harpiste héritée de l'art pharaonique ; mais pour le spectateur hellénisé, il renvoie immédiatement au proverbe de 'l'âne à la lyre'<sup>78</sup>.

## Conclusion

L'Égypte à l'époque ptolémaïque et romaine est un terrain privilégié pour l'étude de la vie musicale. Pour le spécialiste de la musique antique, elle présente une opportunité rare parce qu'elle offre à la fois un corpus de figurines riche et varié et en parallèle une documentation papyrologique sans équivalent dans d'autres provinces de l'empire romain. Mais les deux types de documentation ne se complètent pas de façon systématique et il faut se garder de plaquer de façon mécanique sur les terres cuites les informations recueillies dans les papyrus : ainsi la harpe, souvent montrée sur les terres cuites, n'est quasiment jamais citée dans les papyrus. Néanmoins, il n'échappe à personne que la grande visibilité des aulètes dans la coroplastie recoupe en grande

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<sup>75</sup> Besques 1973, 275-6, fig. 9.

<sup>76</sup> XIX<sup>e</sup> dynastie. Ce papyrus met en scène un cortège d'animaux musiciens : Cf. Hickmann 1961, fig. 9 p. 33 (commentaire p. 32).

<sup>77</sup> Athénée (IV, 8, 349 c.) raconte qu'un Alexandrin proposa de changer le dicton 'l'âne à la lyre' pour 'le bœuf à la lyre' en songeant à un citharède, surnommé 'le bœuf'.

<sup>78</sup> Vendries 2010, 211-25.

partie la place prédominante qu'ils occupent dans les contrats de musiciens<sup>79</sup>. Les terres cuites d'Égypte forment un répertoire homogène par le style et les thèmes et permettent d'écrire une page singulière dans l'histoire de la coroplasticité. Il n'en reste pas moins que beaucoup de ces images sont complexes et difficiles à interpréter surtout en raison de l'absence de contexte et de datations bien établies. Comme le notait déjà E. Breccia en 1925, ces figurines ne sont pas réductibles à une seule interprétation et il en est des musiciens comme des autres personnages. Il apparaît que les terres cuites ne peuvent être regardées comme de simples illustrations de 'scènes de genre' : soumises aux méthodes critiques de l'iconographie, remises en série, confrontées aux autres sources, c'est à ce prix seulement que l'on peut espérer leur rendre tout leur sens.

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<sup>79</sup> Perpillou-Thomas 1995, 226 : plus de 70 aulètes sont recensés entre 245 a. C. et le VIII<sup>e</sup> s. "Ce sont de loin les musiciens les plus nombreux. L'onomastique est majoritairement égyptienne, mais on rencontre aussi des noms grecs".

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Pl. IX 1a. Planche regroupant les figurines de musiciens. D'après C.M. Kaufmann, *Ägyptische Terrakotten der Griechisch-römischen und koptischen epoche*, Le Caire, 1913, fig. 88-89.





Pl. IX 1b. Bès harpiste. D'après Fischer, 1993, n° 555 (Tübingen S/13 2677). H. : 8,8 cm. Fin de l'époque hellénistique.



Pl. IX 1c. Pseudo-Baubô avec cithare. D'après J. Vogt, *Expedition von Sieglin, II*, 2. *Die griechisch-ägyptische Sammlung Ernst von Sieglin. Terrakotten*. Leipzig, 1924, pl. CI, 1 (Tübingen, arch. Institut, inv. 5046), II<sup>e</sup> s. a. C.



Pl. IX 2a. Joueur de *phoinix* et danseur. D'après Török, 1995, fig. 151. H. 9,9 cm.  
Début II<sup>e</sup> s. a. C.



Pl. IX 2b. Femme harpiste. MGR Alexandrie, inv. 19501. H.: 14, 5 cm.  
Post-tanagréenne. Dernier quart III<sup>e</sup> ou début II<sup>e</sup> s. a. C. Cliché CeAlex.





Pl. IX 2c. Tambouriniste. Musée du Louvre, inv. E 20875, H.: 21, 8 cm.  
1<sup>er</sup> s. p. C. Cliché Musée du Louvre.



Pl. IX 2d. Joueur de syrinx. Musée du Louvre, inv. E 27421, H. : 15 cm. II<sup>e</sup>-III<sup>e</sup> s. p. C.  
Cliché Musée du Louvre. La réparation en plâtre correspond à l'emplacement  
du sexe.





Pl. IX 3a. Organiste et trompettiste. Musée du Louvre. Inv. CA 426. H. 13 cm.  
Cliché Chr. Vendries. Reproduit avec l'aimable autorisation du Musée du  
Louvre.



Pl. IX 3b. Silène à la trompette. Allard Pierson Museum, Amsterdam. inv. 7136.  
H. : 17, 7 cm. II<sup>e</sup>-I<sup>er</sup> s. a. C. Cliché du Musée.



Pl. IX 3c. Lampe avec Bès accompagné par trois musiciens. D'après Th. Schreiber, *Expedition von Siegling, I. Die Nekropole von Kôm esch Schukâfa*, Leipzig, 1908, fig. 167.



Pl. IX 3d. Âne à la lyre. Musée du Louvre, inv. D/E 4536. H. : 17, 2 cm : II<sup>e</sup>-I<sup>er</sup> s. a. C. Détail. Cliché Chr. Vendries. Reproduit avec l'aimable autorisation du Musée du Louvre.

## The Colors of Sound: *Poikilia* and Its Aesthetic Contexts\*

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### Abstract

*Poikilos* and *poikilia* are, respectively, an adjective and a noun commonly used to describe characteristics of both visual and aural phenomena. But how do the two uses (as term of color and term of sound) relate to each other, and does *poikilos* metaphorically describe the “colors” of sounds? In examining the semantics and ideological connotations of *poikilos* and *poikilia*, as well as the contribution they make to an archaeology of the senses, this paper reflects on the connection between senses, language, experience and representation. It argues for a transformation, between the archaic and late classical period, in the way *poikilos* is used to qualify aspects of the musical experience. In archaic and early classical poetry, *poikilos* captures, rather than a specific feature of sound, a certain mode of relationship with an object, a rapt pleasure in the experience of the beauty of the object through all senses. Later uses of *poikilos* however, especially in connection with the New Music, rely on the (negative) ideological, rather than sensual, dimension of the term, while technical musical vocabulary adopts the metaphor of colors (*chrōmata*) to describe specific features of music and sound.

Poikilos e poikilia sono, rispettivamente, un aggettivo e un nome comunemente usati per descrivere caratteristiche di fenomeni sia visivi che uditivi. Ma come si relazionano tra loro questi due usi (quale termine coloristico e quale termine uditivo) e possiamo affermare che poikilos descrive metaforicamente i ‘colori’ dei suoni? Nell’esaminare la semantica e le connotazioni ideologiche di poikilos e poikilia, e il contributo che essi forniscono ad un’archeologia dei sensi, questo lavoro riflette sulle connessioni tra sensi, linguaggio, esperienza e rappresentazione.

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argomentando a favore di una trasformazione, tra il periodo arcaico e tardo classico, delle modalità con cui *poikilos* è usato per descrivere aspetti dell'esperienza musicale. Nella poesia arcaica e nella prima età classica, *poikilos* rende, più che una specifica caratteristica del suono, un certo modo di relazionarsi con un oggetto, un piacere estasiato nell'esperienza della bellezza dell'oggetto attraverso tutti i sensi. Usi più tardi di *poikilos*, invece, specialmente in relazione alla Nuova Musica, poggiano sulla dimensione ideologica (negativa), più che sensoriale, del termine, mentre il vocabolario tecnico musicale adotta la metafora dei colori (*chrōmata*) per descrivere specifiche caratteristiche musicali e sonore.

### Keywords

*poikilos*, *poikilia*, senses, beauty, aesthetics, New Music

Colors and sounds give unique insights into societies, modern and ancient. A case in point is a provocative article in the *Time* business section of Nov. 9th, 2011, entitled “Will ‘Manly’ Paint Colors Encourage Men to Decorate?”, which opens thus:<sup>1</sup>

Real men don't buy paint with enticing names like Fairytale Green or Butterscotch. They prefer colors dubbed Mo Money and Beer Time instead. Such is the logic at Canada's CIL Paints, which last week renamed 27 of its paint colors in a bid to boost their appeal to men.

CIL Paints' new chromatic strategy included a change from “Plateau Grey” to “5 O'Clock Shadow,” from “Classic Liberty Red” to “Rust on my Truck,” and from “Mystery Sound” to “Top Gun.” The article highlights not only the emotional, aesthetic, and gendered connection people have to colors, but also the social, cultural, economic, cognitive and linguistic networks colors belong to. First, color terms are conventional, based on specific, localized codes: “grey” covers a range of mixes of black and white, but the exact hue of “Plateau Grey” is *a priori* impossible to place on a spectrum. They are also time- and culture-specific. While frequencies of the color spectrum exist through time, not all cultures and languages describe them the same way.<sup>2</sup> Finally, the relationship between description and perceptual reality might differ from person to person: somebody's “mystery sound” can be very different from somebody else's “mystery sound”—or should we call it “Top Gun”?

Facing the colors of the ancient world, we are in many respects like readers of names of CIL paint without the corresponding paint-chips. The same

<sup>1</sup> <http://newsfeed.time.com/2011/11/09/will-manly-paint-colors-encourage-men-to-decorate/>

<sup>2</sup> On the comparative material, Berlin and Kay 1969 is fundamental; Biggam 2012.



can be said of sounds: how can we explore the Greeks' auditory world, starting from sound-names silently read on the page, and get access to an aural reality through *le parole delle Muse*?<sup>3</sup> How do we distinguish nuances between many nouns for noises, voices and sounds (φθόγος, ψόφος, κέλαδος, καναχή, πάταγος, ἡχώ, φωνή, αὐδή, ὄψ, to name only a few), and hear the specific tones and timbres described as λαμπρός (clear, bright), λιγύς (clear, shrill), λευκός (clear, distinct), or λειριόεις (lily-like)? Is it our ear, or our language, that is most dull to ancient sounds, and is there any hope of accessing the “phonosphere” of the Greeks and its meaning?<sup>4</sup>

In the rest of this paper, I propose to focus on a term that encapsulates the difficulty of thinking about sound and color together: ποικιλία (adjective ποικίλος). ποικίλος and its compounds are used to describe both visual and aural phenomena.<sup>5</sup> They describe a dappled aspect (a toad's skin, a horse's coat, a bird's feathers),<sup>6</sup> changing natural phenomena (the wind or the cosmos), and intricately wrought artifacts (shiny armor and jazzy sandals).<sup>7</sup> They are also used of intellectual products (thoughts, lies, counsels) that display malleability and adaptability,<sup>8</sup> and in archaic poets, of a tune, a hymn, the voice of the phorminx, and the art of song-and-dance of a chorus.<sup>9</sup> Finally, at the end of the classical period, critics and music-theorists use ποικίλος and ποικιλία to describe a specific aspect of the virtuoso style of New Music.<sup>10</sup> Most studies explore the semantic realm covered by ποικίλος and ποικιλία as terms of

<sup>3</sup> To use the evocative title of Rocconi's 2003 study on the formation of the musical lexicon in ancient Greece. On the characterization of sound, see Kaimio 1977 and Steinmeyer 1985, which are mostly lexical studies that do not connect poetic accounts of sounds with acoustic theory, by contrast with Barker 2002, Rocconi 2003 and 2004, which do.

<sup>4</sup> Bettini 2008, 3–7.

<sup>5</sup> On *poikilos* used of sound: Kaimio 1977, 148–50; Steinmeyer 1985, 157–8; Rocconi 2004, 30. On *poikilos* used of colors: Grand-Clément 2011, 418–88 is the most comprehensive survey. On *poikilia* in general, Berardi, Lisi and Micabella 2009 is an interesting mix of contributions that seek to define (1) the nature of *poikilia* as a concept, and (2) particular features of *poikilia* (understood loosely as “elaboration”) in different authors, corpora, and intellectual disciplines. The result is as variegated as the concept itself.

<sup>6</sup> A dragon/snake: Alc. fr.1.66, Pi. P.8.46, P.10.46; a bird: Pi. P.4.249, Alc. fr.345.2; a horse: Pi. P.2.8.

<sup>7</sup> Of the throne of Aphrodite: Sapph. fr.1.1; sandals: Sapph. fr.39.2; headband: Sapph. fr.98(a). 11; a bow: Bacch. 10.43.

<sup>8</sup> Of lies: Pi. O.1.29; of counsels: Pi. N.5.28; of mind: Alc. fr.69.7.

<sup>9</sup> Of a tune: Pratin. PMG 708, 3; of a hymn: Pi. O.6.87; N.5.42. Of the sound of a string-instrument: Pi. O.3.8; O.4.2; P.4.14. Of a chorus, Bacch. 11.33.

<sup>10</sup> For example, [Plut.] *De musica* 1141c, 1142d. On the New Music, Csapo 2004 is still the richest study, Csapo and Wilson 2009 a good introduction. Wallace 2009 focuses on the *poikilia* of the New Music, as seen through Plato's criticism.

perception, tie them to the history of one art (visual or musical), and contextualize them within the formation of technical vocabulary.<sup>11</sup> Hardly any work, however, has been done on the significance of its trans-sensual use for our understanding of an ancient, and modern, history of aesthetics.<sup>12</sup> It is under this light that I would like to consider ποικίλος/ποικιλία. My interest resides in a simple question: does ποικίλος refer primarily to a visual sensation, which is used metaphorically to describe sounds and becomes a technical term in the course of the classical period? Or is it used of both sensual domains, visual and aural, (like ῥυθμός or ἁρμονία, for example, used in architecture), without the notion that one field ‘borrows’ from, or is ‘extended to’ the other, in a relationship of dependence? If so, what does ποικίλος tell us about the representation of the (essentially trans-sensual) nature of the experience of music? What ποικίλος invites us to probe is the relationship between senses, experience, language (everyday and technical), and self-conscious reflection on perception and beauty. In the brief space available, I propose to outline four aspects of this relationship. After focusing on how ποικίλος can be examined in the light of the semantics of colors and sounds, I will turn to the contribution that an archaeology of the senses makes to our understanding of ποικίλος, and then outline a few points about the ideology of colors and sounds. The last domain I will explore is that of aesthetics: by comparing two passages that describe the experience of the visual perception of beauty, I propose to locate a transformation in the way musical ποικιλία is understood over the course of the classical period in a change in the place the concept occupies in aesthetic thought.

The most obvious place to start from is the semantics of colors and sounds, since we have access to ancient words describing aspects of the sensory world, but not to ancient senses. Color terms in Greek have been studied since the 1800s, and scholars have commented on the apparent indifference of the ancients to colors as *we*, moderns, perceive them.<sup>13</sup> Some striking examples

<sup>11</sup> Rocconi 2003, 69–77 and 2004 for musical vocabulary metaphorically borrowed from the visual realm; Grand-Clément 2011 on the visual arts.

<sup>12</sup> Stanford 1936, 47–62 has beautiful pages on the significance of trans-sensual vocabulary for the ancient perception of beauty. While some of his statements should probably be revised in light of modern cognitive studies, others remain stimulating ways of thinking about the connection between senses and language: “Synaesthesia is on the sensuous plane what metaphor is in the sphere of words, and both are methods of corroborating by a unanimity of diversities the essential oneness of beauty and truth” (59).

<sup>13</sup> Among the famous nineteenth-century reflections on the topic are Goethe’s 1810 *Theory of Colours*, Dalton’s theory of ancient color-deficiency (‘daltonism’) and Gladstone’s important 1858 article on “Homer’s perception and use of color”. All variously attribute this different chromatic sensitivity to ancient physiological deficiencies.

of this ‘baroque’ use of color terms include Homer’s wine-dark sea (οἶνοπα πόντον) and Simonides’ green-throat nightingale (χλωραύχενες, *PMG* 81.2). Since these early studies, scholars have shown that Greek color terms emphasized aspects other than pigmentation:<sup>14</sup> contrasts, light, intricacy, movement and changing tones more than hues. This is precisely what ποικίλος illustrates: in archaic poetry, it does not describe one color, pattern, or chromatic shade, but a mottled or dapple appearance, or a skillful arrangement of parts. Along with αἰόλος, which captures changing movements and δαίδαλος, which emphasizes elaboration, ποικίλος, and the difficulty of translating it consistently and economically in modern languages, reveals this “otherness” of attention to color mentioned above.

The same can be said of sound-terms: ancient adjectives qualifying sounds betray a sensitivity to other qualities, such as liquidness, clearness, articulation, timbre, besides the characteristics of pitch or volume that our modern vocabulary favors.<sup>15</sup> Ποικίλος again illustrates this different type of attention; for example the compound ποικιλόγηρυς (many-toned) describing the phorminx (*Pi. O.3.8*) is understood as describing the variegatedness of sounds coming from the instrument’s different strings, just as ποικιλόνωτος (with dapple back) describes the different ‘parts’ of the scaly skin of a snake (*Pi. P.4.249*).<sup>16</sup>

Indeed, more than intrinsic qualities of sound, adjectives emphasize aspects of their perception, and can be used across the senses (γλυκύς, sweet, for example, for a honey-cake or a song, *Pi. O.9.102*) without being used metaphorically: γλυκύς used for a song does not suggest that the effect produced by the sound is ‘translated’, in the typical way metaphors work, into the effect produced by the cake, and that something of the cake’s qualities can be imagined as found in the song. This would be confusing “direct appeal to the senses with indirect appeal to our sensory experience and affections as they are conjured up from memory by the imagination.”<sup>17</sup> In that regard, relying on the vocabulary of colors and sounds to investigate the ancients’ sensory landscape and discourse on perception can be deceptive. Aristotle highlights the limitation of

<sup>14</sup> See Gernet 1957; Irwin 1960; Villard 2002; Grand-Clément 2011.

<sup>15</sup> The use of adjectives rather than nouns for sounds is rare in archaic and early classical poetry: Barker 2002, 23 and 24–5. For insightful remarks: Stanford 1936, 47–51; Rocconi 2003, 3–7, with Meriani 2010.

<sup>16</sup> Rocconi 2004, 30.

<sup>17</sup> Stanford 1936, 43. Also Irwin (1960, 210) who asserts that “for the Greek poets of our period, then, the divisions between the senses were not barriers, requiring a conscious transfer of particular vocabulary from one to the other; instead there was an overlapping between senses such as sight and touch, so that something seen could be described naturally in terms of touch”.

this approach by pressing the logic of cross-sensual adjectives. Comparing the use of λευκός (white) to describe visual and aural perception, he underlines the ambiguity:

there is no difference in the terms used, but the variation in kind is immediately obvious in their use; for ‘white’ is *not used in the same sense* as applied to color and as applied to sound.<sup>18</sup> (my emphasis)

Although both ‘white’ and ‘sweet’ apply to different types of sensory perceptions, describing a sound as ‘white’ or ‘sweet’ is unlikely to trigger in the listener the visual feeling of whiteness or sweetness (unless that listener is a true synaesthete). Rather, archaic poetry relies on a vocabulary of perception shared by different senses.

But how can we get behind lexical codes and relate to the Greek sensorium *itself*? For this, a second type of investigation is necessary, a foray into what we could call an archaeology of the senses. Many *Histories of the Senses* have studied the evolution of “seeing, hearing, smelling, tasting, and touching, and consider how they operated in concert.”<sup>19</sup> One of the questions such studies tackle is that of the hierarchy and relationship between the senses one uses to relate to the world, and of the way, conversely, the senses account for our understanding of ancient societies.<sup>20</sup> Many scholars underscore (and unnecessarily accentuate) the divide between aural and visual societies, between societies that process the world through viewing or through other senses. In Greece, inscriptions are a good illustration of this difference of attitude towards medium and senses: while *we* associate inscriptions with viewing, reading, and gathering information through the eye, scholars of ancient literacy have emphasized how inscriptions were sounded out in reading, understood as ‘heard’ by a community, and relied on the rhetoric of orality and even on performance, loosely understood, rather than on vision alone. This brings additional weight to the question of musical ποικιλία. Is the term, then, used as

<sup>18</sup> *Topics*, 106a 29–32.

<sup>19</sup> Smith 2007, 1. See Fèbre 1941, Serres 1985, Ackerman 1990, Howes 2005, Jütte 2005.

<sup>20</sup> Schafer 1977, 10: “in the West the ear gave way to the eye as the most important gatherer of information about the time of the Renaissance, with the development of the printing press and perspective painting”; Cazelles 2005, 6: “At the basis of this distinction between the eyes and the ears lies, in reality, a distinction between the individual and the collectivity.” Smith 2007 contests the binary aspects of McLuhan and Ong’s [1962] work and builds on their insights about intersensoriality under modernity.

a metaphor, borrowing from the visual realm?<sup>21</sup> Or is it, as I think more likely, that Greek can exploit this polysemy (ποικιλία used across senses) for powerful effects? Take for example Pindar's description of the Hours' ποικιλοφόρμιγγος αοιδᾶς (song accompanied by the many-toned phorminx, *O.4.2*): the use of ποικίλος plays on the multi-sensory dimension of perception itself, the visual stimulation created by the elaborately wrought instrument, and the aural complexity of the song. This captures an important feature of any perceptual phenomenon: in experience, senses are never isolated, and (barring physical deficiencies) one receives sensorial input simultaneously through eyes, ears and nose.<sup>22</sup> This is what the ποικίλος compound throws light on. Aristotle again offers some thoughts on the topic:

among the faculties, for the mere necessities of life and in itself, sight is more important, but for the mind and indirectly hearing is more important.<sup>23</sup>

Yet, while Aristotle describes the relationship between different sites of Greek sensitivity and connects them to the mind, he does not explicitly describe how the senses work together in the actual experience of perception of the world. To access this dimension, we need to turn to a third type of question: that of ancient representations of the sensory world in context.

Whatever word they use to do so, the Greeks do not simply describe the colored and aural perception of the world as it looks and sounds to them in a vacuum, but in a social, cultural and religious environment. The representation of the sensory world in narratives, rituals and social practices was structured (among other categories) around poles going from religious silence to ecstatic sound,<sup>24</sup> and from darkness to light.<sup>25</sup> As Gernet has shown for the color purple in ancient Greece and Pastoureau for blue in medieval Europe, values (such as worth, prestige, *mana*, etc.) came to be attached to different hues independently of their actual perceptual reality. In the domain of sounds for example, an ideological divide opposes the representation of the *auloi* as intoxicating, wild, penetrating instruments, and the ordered, calming, enchanting power of

<sup>21</sup> See for example Kaimio (1977, 235 n. 9) who "concentrate[s] upon the question of what aspects of the acoustic phenomenon are mainly illustrated by the metaphors."

<sup>22</sup> For more on the *syn*-aesthetic nature of experience (with an emphasis on simultaneous perception), see Porter forthcoming with the pithy formulation "the Muses work in concert as well as apart."

<sup>23</sup> *Ar. De sensu* 437a 4-6.

<sup>24</sup> Montiglio 2000.

<sup>25</sup> Christopoulos, Karakantza, and Levaniouk 2010.

the *kithara*, much beyond the quality of the sound itself.<sup>26</sup> Put another way, colors and sounds are not features that belong to things, places or events: they are culturally constructed, and the ideology of colors and sounds, as well as the discourse on their value, influence any representation. It is in the context of such ideological constructions that one can explain the application of ποικίλος to abstract nouns. Ποικιλία is not simply linked to perception, but also tied to social representations: Theognis uses it to describe the changeable disposition (ποικίλον ἦθος, 215), not just the colorful skin, of the octopus, whose adaptability is symbolic of the desirable elasticity of deportment valued in archaic and early classical thought.<sup>27</sup> In Pindar and Bacchylides, the adjective qualifies stories, counsels and thoughts (for example δεδαιδαλμένοι ψεύδεσι ποικίλοις μῦθοι, stories wrought with wily lies, *O.*1.29 or ποικίλοις βουλευμάσιν, wily counsels, *N.*5.28) characteristic of a polymorphic and polyvalent kind of intelligence (*mētis*), and a series of compound adjectives describing cunning figures, Hermes and Odysseus (called ποικιλομήτης, full of various wiles (LSJ)), or the Sphinx (ποικιλωδός, of perplexed and juggling song (LSJ) *S. OT* 130) exploit these cultural and social connotations.

None of the three domains I have just highlighted, however, makes clear how ποικίλος connects language and the way the materials of perception are apprehended in themselves. In the remaining space, I would like to suggest an additional way to think about ποικίλος and ποικιλία: as terms of aesthetic and self-conscious discourse on the nature of the sensory experience and its effects.<sup>28</sup> One important element of the archaic and early classical experience of sound, and especially *mousikē* (song-and-dance) is that it involves all the senses, and representations of *mousikē* have recourse to a pan-aesthetic vocabulary.<sup>29</sup> This is different from saying that adjectives cover different sensual domains (for example, a ‘white’ sound), or that senses share a common vocabulary (for example, taste and hearing for ‘sweetness’) or that descriptions

<sup>26</sup> Wilson 1999.

<sup>27</sup> Détienne and Vernant 1974, 27-54.

<sup>28</sup> See Porter (2010, 193) who highlights what studies of aesthetics are lacking: “something more than a history of art and closer to a history of the senses (rather than a history of the body), documenting how the Greeks learned, over the course of the fifth century, to see, hear, and generally to sense their environment in new ways, and to express all of this in a new, self-descriptive, and to varying degrees self-conscious vocabulary.” Since publication of Porter’s book, Halliwell 2011 and Peponi 2012 have opened other avenues of thought about the relationship between song, poetics and pleasure.

<sup>29</sup> Stanford 1936. The same could be said of sympotic vase-paintings, which aim at involving not only the eye, but also the ear in representations of instruments and the effect of their music on symposiasts.



are metaphorical (for example, Pindar's hymn as 'golden-columned temple' (O.6.1-3)). What I am emphasizing here is the multimedia, and in this sense, *syn*-aesthetic nature of the representation.<sup>30</sup> In the opening of the *Theogony* (3-8) for example, the Muses

with delicate steps, dance around the violet spring and the altar of the almighty son of Cronos. And after bathing their soft skin in Permessus or in the Hippocrene or in holy Olmeius, they form a beautiful, lovely chorus at the very top of the Helicon. And they take strength in their steps.

That the aesthetic spectacle of the Muses is imagined as not affecting one sense only is symptomatic of the fact that the experience of the encounter with beauty overwhelms all senses: the experience of *mousikē* encompasses sight of movement, sound of music, and even imaginary haptic (and perhaps olfactory) pleasure of the Muses' soft skin. Perhaps the most evocative description of musical perception as multi-sensory experience is the opening of Pindar's *Pythian* 1 (1-10), which celebrates the phorminx:

Golden phorminx, rightful joint possession of Apollo and the Muses of violet locks, to you the dance-step listens, beginning of the festivities: singers obey your signals, when you prepare to whirl the chorus-leading preludes. And you quench even the eternally flowing fire of warring thunderbolt. The eagle is asleep on Zeus' scepter, swift wing slackened on both sides, the king of birds, and you have poured a gloomy cloud over his crooked head, a sweet seal on his eyelids. And as he slumbers he ripples his liquid back, held under the sway of your rush of notes.

This is no ordinary experience: beyond auditory perception, the description of instrumental music captures the wholeness of the experience, engaging senses—sight and touch—and imagination. And this is where *ποικιλος* can be located in the archaic and early classical period: with its ability to describe several sensual features, the adjective, I submit, is the signal that the encounter with sound or more generally the experience of the world through the senses takes a specific form. Beyond hearing, it signals that the experience triggers something like aesthetic rapture and involves sight, touch and mind, to create the kind of sway the eagle of *Pythian* 1 is under.

A passage of the *Odyssey* probably provides the best description of the nature of the encounter with beauty, and the symptoms it creates in its pan-

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<sup>30</sup> See Porter forthcoming on synaesthesia, and the "complexive nature of aesthetic thought, reflection, and practice".

aesthetic manifestation. Seeing Nausicaa for the first time, Odysseus exclaims (*Od.* 6.150-7; 160-3; 166-8):

If you are one of the gods who hold the vast sky, I say you are Artemis for sure, the daughter of mighty Zeus, given your appearance, your build, your bearing... But if you are one of the mortals living here on earth, three times blest are your father, your queenly mother, three times over your brothers too. You must very much warm their hearts with joy, when they see you stepping into the chorus—such a lovely shoot... I have never laid eyes on any such mortal, neither man nor woman. As I look at you, a sense of wonder takes me. Actually, once I saw such a thing—in Delos, beside Apollo's altar: the young slip of a palm-tree springing up... Just as I was in awe looking at it for a very long time, as no shaft like that had sprung from the earth, so too, lady, I marvel at you, rapt and enthralled...

Besides cunningly flattering the maiden, Odysseus' account captures the sense of wonder and awe (σέβας, 161, ἄγαμαί τε τέθηπά τε, 168) one feels when encountering beauty.<sup>31</sup> It describes the experience as engaging all the senses (warming the heart, engaging the eye in the perception of size, proportion, movement, and the ear in that of imagined choral music), and locates beauty in the relationship between beholder and beheld: not in some actual characteristics that constitute beauty, but in a mode of perception. Beauty causes a yearning to keep looking, and its memory never goes away; even traumatic events such as the ones Odysseus underwent in Book 5 cannot prevent him from recollecting his experience of the beauty of the Delian palm-tree. More characteristically perhaps, to describe the beauty of Nausicaa, Odysseus does not use a simile: Nausicaa is not *like* the palm-tree. It is the *experience* of seeing her that is compared in the next lines with the aesthetic rapture caused by the Delian palm-tree, as if each encounter with beauty were lived as the same 'original', unique, moment of contemplation, while the object triggering this experience differs.

This is, I believe, what ποικίλος encapsulates in the archaic and classical period: it captures, in the description of an animal, an artifact or a sound, the notion that the luscious patterns in a bird's feathers, the wrought motives of a shield, or the many-voiced and swift-moving notes of a lyre cause an aesthetic reaction of rapt pleasure through the senses. Ποικίλος is not exactly synonymous with 'beautiful' either: it is not simply a judgment on beauty, but a self-conscious expression of the sensual nature of its experience. Rather than being transferred from one realm to another, the adjective shows the continuity

<sup>31</sup> This type of feeling is created by the encounter with beauty both in nature (Nausicaa and the palm-tree in Book 6) and in art (the palace of Alcinous in Book 7).

between the senses regardless of their object, and regardless of whether beauty is found in art (choral music) or nature (bird-songs).

To conclude, I would like to succinctly compare this understanding of the use of *poikilia* in archaic poetry with its later uses in connection with *mousikē*. While *poikilos* is best understood as describing a specific mode of approach to the sensory world in the archaic and early classical period, an important change occurs over the fifth century. As Jim Porter summarizes

with the sophists, Athens sees the birth of ‘radical empiricism’ and starts asking questions such as: are these elements (sound and color) anything outside of perception, and experience? If man is the measure of everything, where do we locate color and sound?<sup>32</sup>

The best manifestation of this radical change in the conception of the experience of the beauty of colors and sounds and their contributing to the aesthetic experience can be seen staged in Euripides’ *Helen* (412 BC).<sup>33</sup> The heroine laments her own shapeliness and its fateful consequences, and wishes (262-3):

εἴθ’ ἐξαλειφθεῖς’ ὥς ἄγαλμ’ αὐθις πάλιν  
αἴσχιον εἶδος ἔλαβον ἀντὶ τοῦ καλοῦ . . .

If only I could have been wiped out like an *agalma* and assumed thereafter a viler appearance, instead of beauty . . .

Whether Helen is comparing herself to a polychrome statue or a painting barely matters:<sup>34</sup> what does is that she locates beauty in colors, surface, physical elements that can be isolated, wiped out and taken off. For Euripides’ Helen (and Helen would know), the source of the aesthetic experience and of the rapture beauty causes is not located in the relationship with the observer and in the cross-sensual symptoms it creates, but in the properties of some pigment that cosmetics-like, release some appealing power. The fact that Helen uses a simile is also telling: her reflection on her ‘natural’ beauty is itself shaped by reflections on *mimēsis* (she is like an *agalma*) and beauty in art (she is like an *agalma*). The way Helen discusses beauty is representative of the change in the way elements, perception, and sensation are starting to be theorized: not as a mode of encounter with matter, through vision or audition, but in some

<sup>32</sup> Porter 2010, 197.

<sup>33</sup> On Euripides’ sophistic influences, Conacher 1998.

<sup>34</sup> Allan’s commentary *ad loc.* on the ambiguity of *agalma*.

properties of chromatic or acoustic phenomena. However large and vague this claim might seem, it is substantiated by a change in the other three domains (semantic, phenomenological and ideological) I have highlighted above, and it affects our understanding of musical *poikilia* after the classical period.

First, over the course of the fifth century, the vocabulary of colors evolves to include an abstract word for color (χρῶμα): this lexical addition reveals much more than the constant evolution of the sensual vocabulary. It signals a way of thinking about color as independent from the surface (especially the human skin, χροιά) it describes.<sup>35</sup> A second, parallel, transformation appears in the vocabulary of sounds, as ‘color’ becomes a technical term of musical vocabulary. As Eleonora Rocconi has shown, ‘color’ becomes over the course of the classical period an established metaphor; starting with Aristoxenus, *chrōmatikos* (‘colored’) becomes one of the three adjectives each of which is used to describe a type of intervallic structure (or *genos*) of the tetrachord; and some of these *genē* are further qualified by their ‘shades’ (χροάι). Both terms suggest that color is a way of thinking about the ‘altered’ form of a more standard pattern, “probably the diatonic scale.”<sup>36</sup> Finally, besides this change in the technical vocabulary of music, the discourse on the richness, as well as effects, of the ‘colors’ of sounds itself evolves. Under the influence of Plato, Aristotle and their followers, the ποικιλία capturing the sensual nature of the experience of beauty, and the poets’ pride in describing their composition as *poikilos*, is turned on its head.<sup>37</sup> ποικιλία becomes, along with πολυχροδία (many-stringedness) and πολυφωνία (many-notedness), one of the characteristics of the (much-criticized) virtuoso style of the New Music (for example [Plut.] *De mus.* 1141c, 1142c). Rather than being described as an experience involving all the senses, or ideologically connected to *mētis* and its positive connotations, the new *mousikē* is characterized by the complexity of its musical features. By contrast, archaic *mousikē* is constructed as simple (ἁπλοῦς, [Plut.] *De mus.* 1141c) and dignified (σεμνός, 1135d), and ποικιλία becomes the site of an “ideological struggle. The description of instrumental music as ‘complex’ becomes a symbol for plurality, changeability, innovation, openness, liberation, inclusiveness and mixing.”<sup>38</sup> A dichotomy is introduced between the vocabulary of colors and shades as now belonging to the technical (metaphorical) vocabulary of music

<sup>35</sup> Grand-Clément 2011, 492-3.

<sup>36</sup> Rocconi 2004, 30-3, 31 for the quotation. As she points out, this use is different from the older, non-technical, use of the term, for example Ath. 638a relating Philochorus’ description of the kithara-music of Lysander as χρώματα εὐχροα, lovely-shaded colors.

<sup>37</sup> Fowler 1984 on ποικιλία and the archaic aesthetic.

<sup>38</sup> Csapo and Wilson 2009, 291-2, with further reference to Csapo 2004.

theorists describing tonal modulations, and the ideology of *poikilia*, with its negative connotations. Still emphasizing variety and richness, the term *poikilia* is no longer used to qualify the mode of relationship between listener and aural matter (a relationship described under the sign of beauty), or to highlight the sensual nature of the experience of music, but is used in connection to sound as a catch-all term with a musical past to underline the subversive socio-cultural potential perceived in a certain type of *mousikē*.

It is only insofar as we explore *ποικιλία* in these different contexts of aesthetic discourse that we can fully appreciate the change in the use of the word: to the evolution in the semantic context, ideological value and aesthetic uses of the term corresponds a change in the way the aural experience itself is self-consciously described. *Ποικιλία*, in critical discourse, ceases to be the privileged term to describe the uniqueness of the aesthetic experience in its multiple sensual guises. In the post-classical vocabulary of sound, musical *ποικιλία* stops being comparable to the visual experience of the beauty of birds, snakes and palm-trees and is limited to its (new) socio-political negative connotations. Estranged from the sphere of sensual experience, cross-sensual *poikilia* gives way to metaphorical *chrōmata* as a means of describing rich alterations from a plainer pattern—echoing Helen's reflection on her beauty, rather than Odysseus on Nausicaa's.

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## The Debate on *logos* and *diastēma* in Porphyry's *Commentary* on Ptolemy's *Harmonics*\*

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### Abstract

Introducing his commentary on Ptol. *Harm.* I.5, Porphyry discusses at length the vocabulary of musical intervals and in particular the question whether the words λόγος and διάστημα should or not be used as synonyms. This paper aims, on the one hand, at analysing the way in which he chooses and arranges his sources; on the other hand, at restoring them to the original debate to which they belong—a debate in which a seminal role seems to have been played by Plato's *Timaeus* and the contributions of its early commentators (Eratosthenes, Aelianus, Panaetius) in the framework of post-Aristoxenian harmonics.

Nell'introdurre il suo commento a Ptol. *Harm.* I.5, Porfirio tratta a lungo del lessico degli intervalli musicali e in particolare della questione se le parole λόγος e διάστημα si possano o meno utilizzare come sinonimi. Lo studio si propone da una parte di analizzare il modo in cui Porfirio sceglie e dispone le sue fonti, e dall'altra parte di collocare tali fonti nel loro contesto originale, che sembra essere un dibattito in cui un ruolo fondamentale dovette esser giocato dal *Timeo* di Platone e dai suoi primi commentatori (Eratostene, Eliano, Panezio) nel quadro della teoria armonica post-aristossenica.

### Keywords

Porphyry, musical intervals, Plato, *Timaeus*

A treasury of quotations from ancient authors, many of which are otherwise unknown, Porphyry's *Commentary* on Claudius Ptolemy's *Harmonics* is far

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from new to being plundered by scholars aiming at unearthing a previously undetected fragment, redefining the boundaries of one citation, or questioning the long-established attribution of another. The present article harbours a different ambition: to address Porphyry's way of choosing and arranging his sources, in order to shed light on the original contexts to which they belonged and to draw attention to the hiatus, if any, between those contexts and the new ones the commentator sometimes forces them into. My case study will be Porphyry's introduction to Ptolemy's *Harmonics* I.5, which is devoted to explaining the Pythagoreans' method of linking the main concords—the fourth, the fifth and the octave—to their respective ratios.<sup>1</sup> Before engaging with the text, Porphyry adds a lengthy preamble<sup>2</sup> entirely dedicated to whether the two words that indicated the relation between two notes in ancient Greek—*λόγος* ('ratio') and *διάστημα* ('gap', 'interval')—should be considered as synonyms and, *qua* synonyms, completely interchangeable.<sup>3</sup> The sources are basically arranged in two groups: those maintaining a difference between the two words (henceforth referred to as Group I) and those who used the latter where the meaning of the former would have been required (Group II). An overall glance at the discussion tells us that Porphyry built each block around one or two authoritative names: Eratosthenes for Group I, Plato and Archytas for Group II. The core of each group is buttressed, as it were, with references to more recent writers: on Eratosthenes' side are Aelianus, Philolaus, Thrasyllus and Diodorus, and on that of Plato and Archytas are Euclid, Demetrius, Panaetius and Dionysius. Before I go further, there is one point I should like to stress. Although this digression prefaces a discussion of musical concords, the whole debate is not, or at least not entirely, about musical *διαστήματα*; in fact, in most

<sup>1</sup> Here begins the second part of the *Commentary* (on Ptolemy I.5–15), whose authorship has been debated in the past. Lucas Holstenius' opinion (1655, 38–9) that it should be assigned to Pappus of Alexandria was mainstream as late as Düring's edition. Schönberger (1914, 127–8) pointed out some inconsistencies between the first and the second part. Even more radically, Ruelle (1875, 414) denied Porphyry any involvement in the *Commentary* and attributed the first part (on I.1–4) to Pappus and the rest to Theon of Alexandria. Düring convincingly dismantled these arguments and restored the authorship of the whole work to Porphyry (full discussion in Düring 1932, xxxvii–xxxix).

<sup>2</sup> 29.27–38.7 D. Porphyry uses introductions only twice in the whole *Commentary* (the other case being I.3), apparently when he thinks it necessary to provide the reader with background knowledge or to compensate for Ptolemy's lack of source quotations. On Porphyry's criticism of Ptolemy's occasionally 'silent' treatment of the sources see 5.7–15 D.

<sup>3</sup> See e.g. Rocconi 2003, 75–7. For conceptual aspects of the difference between these two denominations, see the classic article of Riethmüller 1985.

of the sources recalled here διάστημα means ‘difference’ or ‘distance’ between two objects that are comparable—not necessarily notes.

Let us now go into the details, starting with Group I. Eratosthenes (91.4–10 D) is said to have distinguished διάστημα from λόγος on the grounds that the ratio between two quantities changes depending on the order in which we place the terms (e.g. 9:8 or 8:9), but the gap between them does not. As reasonably suggested by Düring, this must come from the *Platonicus*, the lost dialogue—perhaps a commentary on Plato’s *Timaeus*—also quoted by Theon of Smyrna,<sup>4</sup> in which Eratosthenes engaged with the proportions described in the *Timaeus* before expounding his own conception of ἀναλογία;<sup>5</sup> it is highly probable, therefore, that in this context he tackled the difference between διάστημα and λόγος.<sup>6</sup> In fact, we cannot say if he referred to ratios in general, as mathematical and geometrical entities, or to musical intervals in particular; nonetheless, the fact that both Theon and Porphyry quote this passage, albeit not precisely in the same way,<sup>7</sup> with reference to music, suggests that Eratosthenes’ discussion had some bearings on music theory. However, if this fragment has anything to do with music, it is perhaps to be put in relation to Eratosthenes’ harmonics, in particular with his attempt to convert Aristoxenus’ linear intervals into Pythagorean ratios,<sup>8</sup> as though the acknowledgement of the difference between διάστημα and λόγος had been preliminary to his tetrachordal divisions.

Aelianus the Platonist,<sup>9</sup> Philolaus and Thrasyllus are said to have taken Eratosthenes’ thought as their starting point (ἀπὸ δὴ τούτου κινηθέντες). We may leave out Philolaus, whose mention is very problematic for obvious

<sup>4</sup> Düring 1932, *app. ad loc.*

<sup>5</sup> On the *Platonicus* in general see Hiller 1870. On the possibility that this work was a commentary on the *Timaeus* see Creese 2010, 179 and n. 4 (with bibliographic references).

<sup>6</sup> See Hiller 1870, 68; Solmsen 1942, 194, 197–8.

<sup>7</sup> Theon. Smyrn. *de util. math.* 30, pp. 81.17–82.5 Hiller. If we read Theon, Porphyry’s remark that Eratosthenes failed to clarify ‘either why it is called διάστημα, or in what respect it differs from λόγος’ (ἐκ δὴ τοιούτων οὐτε τί καλεῖται διάστημα, οὔτε καθ’ ὃ διαφέρει τοῦ λόγου παρέστησεν) seems to be only partially justified. It is true that in neither version is διάστημα clearly defined; nevertheless, Theon’s version has at least one difference between διάστημα and λόγος, namely that a διάστημα, unlike a λόγος, can only exist between items that are not equal to one another. On the contrary Theon, unlike Porphyry, does not include the idea that there are two λόγοι for each διάστημα. Whether Porphyry’s criticism is his own or was already in his source, it seems based on a reading of Eratosthenes, slightly different from that accessible to Theon.

<sup>8</sup> See Barker 1989, 345 n. 112, 346 n. 117, 347 n. 122, 349 n. 125; Creese 2010, 178–209.

<sup>9</sup> Otherwise unknown. Barker (1989, 230) suggests that he is the second-third century AD rhetorician Claudius Aelianus; sceptical on any possible identification is Goulet (1989), who assigns him dubitatively to the second century AD. There is no mention of this Aelianus in *RE*.

chronological reasons;<sup>10</sup> as for Aelianus, it seems reasonable that Porphyry drew upon his commentary on the *Timaetus*.<sup>11</sup> We know too little about his and Thrasyllus' thought to tell if they really followed Eratosthenes' lead on this matter; however, their views seem to be compatible with his at least in agreeing that there is no διάστημα between two notes of the same pitch, as can be deduced from Aelianus' and Thrasyllus' definitions.<sup>12</sup> Regarding the difference between διάστημα and λόγος, Aelianus holds—once again, compatibly with Eratosthenes—that διάστημα remains the same no matter whether the two notes are considered from the lower to the higher or *vice versa*,<sup>13</sup> so that one might infer, *e silentio*, that λόγος does not; Thrasyllus' view is impossible to determine, because in his fragment λόγος is not contrasted with διάστημα but, quite surprisingly, with ὑπεροχή (the arithmetical difference between the terms of a ratio).<sup>14</sup>

Group I should also include, I suggest, the Diodorus mentioned a little further on (92.26), for the context makes it clear that he distinguished διάστημα from λόγος. I suspect that he is the first century BC mathematician from Alexandria<sup>15</sup>

<sup>10</sup> This Philolaus cannot be the well-known Pythagorean who flourished in the fifth century BC, *pace* Huffman 1993, who includes this text as *testimonium* A25 in his edition of Philolaus' fragments. Therefore, either this is a different Philolaus, otherwise unknown (Düring 1934: 177; for further discussion see Huffman 1993: 378-9), or Porphyry might have misunderstood some references to Philolaus he found in Aelianus or Thrasyllus. This seems quite likely, since Philolaus' well-known account of the structure of the octave involved a mention of the 9:8 tone as the ratio by which the fifth exceeds the fourth (τὸ δὲ δι' ὀξείαν μείζον τὰς συλλαβάς ἐπογδῶι, Philol. *frag.* 6a.14-15 Huffman). Another possibility, which has been suggested to me by Andrew Barker in private correspondence, is that Φιλόλαος is just a *lectio facilior* for Φιλίσκος, the otherwise unknown theorist mentioned by Porphyry at 3.7 D among the successors of Aristoxenus.

<sup>11</sup> See 33.17-36.3 D.

<sup>12</sup> Cf. 35.21-22 D τὸ [...] δυεῖν φθόγγων ἀνομοίων ὀξύτητι καὶ βαρύτητι διαφέρον (Aelianus, *Comm. in Tim.*), and 91.16-18 D τὸ δὲ διάστημα λέγουσιν αὐτὴν τὴν διαφορὰν τὴν γινομένην πρὸς ἀλλήλους δύο φθόγγων τῶν ἀνομοίων, οἷον ἂν ὁ μὲν ᾗ βαρὺς, ὁ δ' ὀξύς, ἡ παρ' ἀλλήλους διαφορὰ διάστημα προσαγορεύεται (Thrasyllus, *On the Heptachord*, probably part of a broader writing on harmonics: see Tarrant 1993:110).

<sup>13</sup> ἡ διαφορὰ τοῦ ὀξυτέρου παρὰ τὸν βαρύτερον φθόγγον καὶ τοῦ βαρυτέρου παρὰ τὸν ὀξύτερον καλεῖται διάστημα, 35.15-17 D.

<sup>14</sup> 91.16-92.8 D = *test.* 15a Tarrant. I suspect that Porphyry either omitted or dropped part of Thrasyllus' text. The passage from a musical context (τὸ δὲ διάστημα λέγουσιν κτλ.) to a merely mathematical one (διαφέρει δὲ λόγος ὑπεροχῆς· καὶ κατὰ τοῦ ὄντος γὰρ διπλήχους καὶ πηχυαίου ἡ μὲν ὑπεροχή κατὰ μονάδα θεωρεῖται· ὁ δὲ λόγος διπλασίων τοῦ μείζονος ὅρου πρὸς τὸν ἐλάσσονα. κτλ..) is quite awkward and the two sentences are not very well linked to each other (see e.g. the two consecutive instances of δέ instead of the expected μὲν... δέ); one would have rather expected something like διαφέρει δὲ λόγος διαστήματος κτλ.

<sup>15</sup> *RE* s.v. Diodoros, vol. V, 1, no. 53, col. 710-712; Flamand 1994.

(rather than Diodorus of Eretria, as has been tentatively suggested),<sup>16</sup> on the grounds that: a) he is mentioned along with two mathematicians, Demetrius—probably the γεωμέτρης who was Porphyry's teacher in his Athenian years<sup>17</sup>—and Panaetius; b) Diodorus of Alexandria seems to have had an inclination for the subtleties of word meaning. According to Achilles Tatius, who interestingly connects his work to the astronomical vocabulary of the *Timaeus*,<sup>18</sup> he provided six different meanings for the word κόσμος, so he might well have done something similar with διάστημα; c) his being a mathematician makes it plausible that his books were known to Demetrius and perhaps, through his library, accessible to Porphyry. Indeed, Demetrius' distinction between διάστημα τοπικόν ('linear gap') and διάστημα κατὰ δύναμιν ('ratio') (94.31–95.1 D) might be a response to Diodorus' quibbles.

Of the authors arrayed in the opposite camp (Group II, 92.12–93.17 D), who according to Porphyry had 'habitually' (συνήθως) used διάστημα in the sense of λόγος, only two, i.e. Plato and Archytas, deserve the epithet of 'ancient' (παρὰ τοῖς ἀρχαίοις κτλ.), which in Porphyry often has an aura of authoritativeness to it. In the *Timaeus* Plato has the Demiurge fill up all the 4:3 intervals with 9:8 ones<sup>19</sup> and, according to the mathematicians Demetrius and Panaetius, 'habitually'<sup>20</sup> uses διάστημα with reference to ratios, not excesses, just as most κανονικοί do.<sup>21</sup> If the Demetrius who in his *On the Connection of the Ratio* (Περὶ λόγου συναφῆς) reportedly disagreed with Diodorus (92.25–27 D: see above) is

<sup>16</sup> Bidez-Cumont 1938: II, 64, n. 1.

<sup>17</sup> Procl. in *Remp.* 2.23.14. For the presence of this Demetrius in Athens at the Πλατωνεία (annual celebrations in honour of Plato organised by Longinus; see Maraval-Goulet 1994) see Euseb. *Prep. Ev.* 10.3.1.

<sup>18</sup> Achill. *Isag. exc.* 5.35–45 Maass.

<sup>19</sup> Pl. *Tim.* 36b ἡμιολίων δὲ διαστάσεων καὶ ἐπιτρίτων καὶ ἐπογδῶν γενομένων ἐκ τούτων τῶν δεσμών ἐν ταῖς πρόσθεν διαστάσεσιν, τῷ τοῦ ἐπογδῶς διαστήματι τὰ ἐπίτριτα πάντα συνεπληροῦτο, κτλ.

<sup>20</sup> The adverb is emphatically repeated at 92.12 and 20. In fact, in the extant Platonic corpus the word διάστημα occurs six times altogether: *Phil.* 17c-d ἄλλ', ὦ φίλε, ἐπειδὴν λάβῃς τὰ διαστήματα ὅποσα ἐστὶ τὸν ἀριθμὸν τῆς φωνῆς ὀξύτητος τε πέρι καὶ βαρύτητος, καὶ ὅποια, καὶ τοὺς ὁρους τῶν διαστημάτων, [...] τότε ἐγένου σοφός, κτλ.; *Resp.* 531a νῆ τοὺς θεοὺς, ἔφη, καὶ γελοῖως γε, πυκνώματ' ἄττα ὀνομάζοντες καὶ παραβάλλοντες τὰ ὦτα, ὅλον ἐκ γειτόνων φωνῆν θηρευόμενοι, οἱ μὲν φασιν ἔτι κατακούειν ἐν μέσῳ τινὰ ἤχην καὶ μικρότατον εἶναι τοῦτο διάστημα, ὧ μετρητέον, οἱ δὲ ἀμφισβητοῦντες ὡς ὅμοιον ἤδη φθεγγομένων, ἀμφοτέροι ὦτα τοῦ νοῦ προστησάμενοι. (see below and fn. 32); *Tim.* 36a μετὰ δὲ ταῦτα συνεπληροῦτο τὰ τε διπλάσια καὶ τριπλάσια διαστήματα, μοίρας ἔτι ἐκείθεν ἀποτέμνων καὶ τιθεῖς ἐς τὸ μεταξὺ τούτων, ὥστε ἐν ἑκάστῳ διαστήματι δύο εἶναι μεσότηας, κτλ.; 36 b (see fn. 19). In none of these cases, however, does the word refer explicitly to ratios: even the *Philebus* expression τοὺς ὁρους τῶν διαστημάτων lends itself to ambiguity, because ὅροι can be either the *termini* of a ratio or the physical limits of a vibrating string or air column.

<sup>21</sup> 92.19–23 D. It should be noted, incidentally, that for this argument to hold διάστημα is to be taken as a perfect synonym of διάστασις.

indeed Porphyry's teacher,<sup>22</sup> it might be through his writings or his library that Porphyry had access not only to Diodorus, but also to another theorist called Dionysius of Halicarnassus (92.28 D).<sup>23</sup>

Porphyry could have found the reference to Eratosthenes in Panaetius,<sup>24</sup> who pointed out some inconsistencies in Eratosthenes' usage of διάστημα.<sup>25</sup> We do not know the context in which these inconsistencies occurred; however, if we assume that Porphyry's source was Panaetius' work *On Intervals and Ratios in Geometry and Music* (Περὶ τῶν κατὰ γεωμετρίαν καὶ μουσικὴν λόγων καὶ διαστημάτων, also quoted at 65.21-22 D), it is extremely likely that Panaetius contrasted Eratosthenes' usages of the word in geometrical and mathematical contexts with those concerning music theory. As for Pseudo-Euclid, Porphyry must have been spoilt for choice, given the numerous passages of the *Section canonis* in which adjectives pertaining to ratios (e.g. διπλάσιον or ἐπιμόριον) are attached to the word διάστημα (92.29-93.4 D). Finally, in Archytas' famous account of the three means (93.5-17 D = fr. 2 Huffman) διάστημα unequivocally indicates ratios,<sup>26</sup> ὑπεροχά having the same meaning as in Thrasyllus.

The third and last part of the discussion (93.18-95.23 D) deals with the Aristoxenian idea that intervals are something 'spatial'<sup>27</sup> and, accordingly,

<sup>22</sup> The Demetrius who taught Porphyry and the author of the work on ratios are treated as two different individuals in *RE* s.v. Demetrios, vol. IV, 2, nos. 118 (col. 1849-2850) and 110 (col. 2947) respectively.

<sup>23</sup> Hardly the well-known rhetorician and historian of the same name (although he did use the word for musical intervals, see *comp.* 11.73-74; 11.88-91), this Dionysius is more likely to be the theorist and music historian, also from Halicarnassus, elsewhere referred to as 'the musician', author of a treatise *On Likenesses* (περὶ ὁμοιοτήτων, 37.15-16 D), who flourished under Hadrian (see *RE* s.v. Dionysios, vol. IV, 2, no. 142, col. 986-91). His fragments are collected in Scherer 1886, 50-54.

<sup>24</sup> Probably the same Panaetius referred to by Porphyry as 'the Younger' (65.21 D), author of a work *On Ratios and Intervals in Geometry and Music* (περὶ τῶν κατὰ γεωμετρίαν καὶ μουσικὴν λόγων καὶ διαστημάτων); see *RE* s.v. Panaitios, vol. XVIII, 3 no. 6, col. 440-41; Barker 1989, 230.

<sup>25</sup> 92.23-25 D βεβαίοι δὲ καὶ τὸ προκείμενον καὶ Παναίτιος ἀποδείξας, ὅτι καὶ αὐτὸς Ἐρατοσθένης κατεχρήσατο πού τῷ διαστήματι ἀντὶ τοῦ λόγου. I believe that the verb κατεχρήσατο belongs to Panaetius' text rather than to Porphyry's paraphrase: cf. Panaetius' words at 65.26-27 D καὶ κατὰ μουσικὴν δὲ τὸ λεγόμενον ἡμιτόνιον κατάχρησις ἐστὶν ὀνόματος.

<sup>26</sup> In the case of the arithmetic mean, συμπίπτει ἡμεν τὸ τῶν μειζόνων ὄρων διάστημα μείον, τὸ δὲ τῶν μειόνων μείζον: if the proportion is 12:9=9:6, we have 12/9<9/6. In the geometric mean οἱ μείζονες ἴσον ποιοῦνται τὸ διάστημα καὶ οἱ μείους, as in 12:6=6:3=2. As for the subcontrary mean, γίνεται [...] τὸ τῶν μειζόνων ὄρων διάστημα μείζον, τὸ δὲ τῶν μειόνων μείον: given 12, 8, 6, where 12:8=4=(12x1/3) and 8:6=2=(6x1/3), we have 12/8>8/6. See Huffman 2005: 162-181.

<sup>27</sup> At 94.11 I read τοπικόν with Wifstrand (1934: 9, fn. 1) and Alexanderson (1969: 50) instead of the mss.' τὸ ποικίλον, which does not make sense.



understandable in quantitative terms.<sup>28</sup> To sum up, there are some who use διάστημα even in the sense of λόγος; others who intend διάστημα in the sense of ‘difference’ (διαφορά or ὑπεροχή) and accordingly use the term only with reference to entities unequal to each other; and finally, there is the spatial conception of the Aristoxenian διάστημα between two notes (94.31–95.19 D). It becomes clear, therefore, why Porphyry says that ‘there are three schools of thought, or perhaps two altogether’ (τρεις . . . αἰρέσεις ἢ πάντως δύο, 94.29–30 D), the Aristoxenian τοπικὸν διάστημα being indeed nothing but a particular case of the second view. His conclusion is that the word for ‘interval’ can be used in the sense of either ‘excess’ or ‘ratio’, depending on the contexts; and if we are to accept the former usage—as we do indeed—it would be absurd (ἄτοπον) to reject the latter (94.22.26 D).

Thus, the *Timaeus* seems to have functioned as a sort of seminal text to the whole debate. It is reasonable that Porphyry, who arguably wrote a *Timaeus* commentary himself,<sup>29</sup> had access to other writings on that dialogue, be they full commentaries or anthological collections of different commentators’ remarks on single passages; it is little surprise, therefore, that he approached the issue from that angle. A thread seems to depart from Plato’s text, leading directly to the commentaries of Eratosthenes and Aelianus, which constitute the bulk of Group I; another thread, starting from Eratosthenes, leads—perhaps through Panaetius—to the more mathematical and geometrical sources of Group II (Demetrius, Diodorus, Dionysius). As for Archytas, his theory of the three means is extremely likely to have been quoted by virtually every *Timaeus* commentary, given that it informs the number series created by the Demiurge at 35b–36a<sup>30</sup>—that is, in the passage immediately preceding the one quoted by Porphyry. Such a grouping, however, although mirroring the structure of Porphyry’s library and his needs as a commentator of Ptolemy, hardly reflects the original status of the debate, nor does it tell us what triggered it.

<sup>28</sup> 93.28 D διὸ καὶ μεγέθει γνωρίζεται πάντως [sc. τὸ διάστημα]. In other cases the term expresses a qualitative difference, such as with colours of different intensity (ἐπίτασις, 94.6–10 D) and objects moving at different speeds (γίνεται δὲ καὶ ἐν κινουμένοις διάστημα ἢ κατὰ τὴν ἐπίτασιν τοῦ ἐν αὐτοῖς τάχους διαφορά, 94.15–16 D).

<sup>29</sup> The fragments of this work are edited by Sodano 1964. We do not know if it was written before the commentary on Ptolemy; however, it was Düring’s opinion (1932: XXXVIII–XXXIX) that this is the writing Porphyry mentions at 115.30–116.1 D with reference to the so-called “*Timaeus*-scale”.

<sup>30</sup> See Pelosi 2010, 192, n. 68.

In spite of Porphyry's enrolment of Plato and Archytas in Group II, they both would have probably been surprised had they known the way their words would be commented on; indeed, chances are that the urgency of the debate as such would have escaped them. From Plato's point of view, there must have been nothing controversial with such expressions as τῷ τοῦ ἐπογδῶδου διαστήματι and others of the same sort, not only because, as Andrew Barker has opportunely pointed out, the context was not specifically musical,<sup>31</sup> but also because, I would suggest, at that stage in the development of harmonics the word διάστημα had not yet acquired any problematic overtones. It should be borne in mind that even in Plato's famous attack on the so-called ἄρμονικοί (*Resp.* 531 a-b), his biting criticism is directed at their practice of 'densifying' musical intervals (πυκνώματα) rather than the notion of διάστημα *per se*.<sup>32</sup> Similar, in some way, is the case of Archytas: although he clearly uses διάστημα with reference to the ratio between the terms of a proportion, we need not assume—*pace* Porphyry or his sources—that he necessarily intended the word as a synonym for λόγος rather than merely in the Platonic sense of 'audible interval'.<sup>33</sup> In fact, a sharp opposition between διάστημα and λόγος could hardly be seen before Aristoxenus, who paved the way for it, although with no explicit theorisation, with his rejection of λόγοι as irrelevant to the understanding of the diastematic movement of melody.<sup>34</sup> A further step in that direction was arguably taken by his followers, as is also discernible in Porphyry's text, where Aristoxenus is mentioned only once (93.26), most of his references being to οἱ Ἀριστοξένειοι instead. The likening of the positions of notes in space to those of 'beams, walls, pillars', as well as to the length of steps that could be taken within a given space, is not found directly in Aristoxenus and presumably belongs to the didactic repertoire of Aristoxenian music teachers.<sup>35</sup> This sort of imagery was simplistically based on the attribution of the linear and the rational assumptions to the Aristoxenians and the Pythagoreans respectively and, in all likelihood, contributed to establish it as a commonplace.

We may speculate that the vocabulary of musical intervals was apparently a strategic terrain on which the Platonists had to oppose in some way the Aristoxenians' tendency to appropriate the word διάστημα as a trademark of their own paradigm; thus, looking to Plato's *Timaeus* and Archytas—οἱ ἀρχαῖοι—for

<sup>31</sup> Barker 2007, 320.

<sup>32</sup> Cf. Barker 2007, 23-5; Meriani 2003.

<sup>33</sup> See Barker in Huffman 2005, 181.

<sup>34</sup> See e.g. Aristox. *EH* 2.32, 41.10-42.7 Da Rios; Barker 2007, 166-8.

<sup>35</sup> ὃν τρόπον ἐπὶ κιόνων ἢ τοίχων, κτλ., 93.24 D. I owe this suggestion to Barker 2011.

an authoritative legitimisation of the extended use of διάστημα (κατάχρησις, in Panaetius' parlance) must have sounded to some of them (Group II) as an effective strategy. Not by chance is the pseudo-Euclidean *Sectio Canonis*—the work that best symbolises the Pythagorean reaction to Aristoxenus' ideas and the systematisation of harmonics as an axiomatic science between the fourth and third centuries BC<sup>36</sup>—abundant with occurrences of διάστημα in the extended meaning of “ratio”. This should not entitle us, however, to casting Group I the role of an uncompromising minority, refusing to yield to their opponents' vocabulary. In fact, the semantic distinction between διάστημα and λόγος seems to have survived better in non-musical contexts, even well after the *Sectio*. Indeed, if I am right about Panaetius' remarks on Eratosthenes, it could have happened that the same theorist opposed the extended usage of διάστημα in mathematical, geometrical and perhaps astronomical contexts, while being prepared to allow it in music theory.

Thus, beneath the arrangement superimposed by Porphyry on his material, the mapping of his library and the interconnections between his sources reveal an interesting chapter in the exegesis of Plato and the shifting usages of technical terms from classical to post-Aristoxenian music theory.

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<sup>36</sup> For the anti-Aristoxenian character of the *Sectio* see Creese 2010, 131–6.

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## Book Reviews

Power, T. 2010. *The Culture of Kitharôidia*. Cambridge, Mass., Harvard University Press. xiv, 638 pp. Pr. \$18.95 (pb). ISBN 9780674021389.

*The Culture of Kitharôidia*, now available online for free at the link <http://chs.harvard.edu/wa/pageR?tn=ArticleWrapper&bdc=12&mn=4400>, aims at restoring *kitharôidia* to the pre-eminent cultural place which it enjoyed in ancient times, from the archaic period well into the late imperial age, but which has often been overlooked in modern scholarship as a consequence of the almost complete loss of citharodic texts.

Such an ambitious task, welcome inasmuch as it fills in a major void in Classical studies, is developed through a concise preface (xi–xiv) and four main exegetical parts, followed by plates (555–69), bibliography (571–615) and two indexes, *locorum* (617–25) and general (627–38), which—although not always as detailed as one would wish,<sup>1</sup> especially when faced with such a rich and long volume—still help the reader to navigate the book.

Part I (*Princeps Citharoedus*, 3–181) takes Nero's (in)famous citharodic passion as the starting point to illustrate various aspects of *kitharôidia*, from its glamorous appeal to its professional demands, and from its technicalities to the wide-spread popular favor it enjoyed, which was usefully exploited in the service of political control, strategy and persuasion. Ranging as it does from ancient Greece to the late Roman empire, and considering an unprecedented number of different sources, this section provides the reader with a vivid, learned picture of *kitharôidia* which accounts for both its performative practice and its socio-cultural implications.

Part II (*Anabolê, Prooimion, Nomos*, 185–314) is designed to reconstruct the form and content of the citharodic songs: the internal partitions and rules of the *nomos* and its possible development from a citharistic accompaniment to a given choral song are described, followed by a hypothetical series of subjects which the lost citharodic sagas may have addressed. In this connection, Power pays constant attention to the relationship between *kitharôidia* and other contemporary ways of performing heroic themes, especially epic *rhapsôidia* and the Stesichorean tradition, which were already singled out by Burkert<sup>2</sup> as the citharodes' main rivals.

<sup>1</sup> For example the footnotes, although rich in detail and textual quotations, are not always accounted for in the Index *locorum*, while the General index on the one hand features the likes of jazz—undoubtedly a brilliant *comparandum* for the citharodic habit of inserting extemporaneous, personal elements within the performance of a fixed *nomos*—but on the other hand omits *e.g.* triadic structure, although it is mentioned in the book as a clue for choral performance.

<sup>2</sup> See Burkert, W. 1987. *The Making of Homer in the Sixth Century B.C.: Rhapsodes versus*

Part III (*Inventions of Terpander*, 317-422) revolves around the figure of Terpander, subjected to an analysis which is presented as different from the one in the still fundamental work by Antonietta Gostoli.<sup>3</sup> Power purports to extract from each source not the truth about a given detail of Terpander's life and works, but rather "the refractions of deeper and broader 'cultural truths' about the performance genre of *kitharoidia* as a whole" (322), thus relating his survey to analogous research on the diachronic, multi-layered and polysemic reception of ancient poets, their biographic traditions and their poetical fortune.<sup>4</sup> Placed against this background, the double meaning and double goal conveyed by the title attributed to Part III become clearer: the "Inventions of Terpander" taken into account are both the technical, poetic and performative improvements of which Terpander is traditionally deemed *πρῶτος εὐρετής*—suffice it to mention here the seven-stringed professional *kithara*—and also the ever-changing perception of these improvements by different ages, peoples and cultural agendas.

The last part (*Panathenaic Kitharoidia*, 425-554) discusses the Athenian exploitation of the citharodic *medium* in all its different agonistic displays, both for professional musicians and for aristocrats turned into competitors, and in its complex interlacing with the political upheavals from Peisistratid tyranny to Periclean democracy, the defeat in the Peloponnesian War and the 'classical renaissance' promoted by Lycourgos. This chapter ends with a detailed survey of Timotheus' *Persians* in relation to an Athenian and a panhellenic performance arena, and of the changing perceptions of Timotheus, from the ultimate rule-breaker to the classic citharode *par excellence*.

Such a brief summary hardly does justice to the number of issues successfully addressed throughout the book, accurate both in its content and in its editing.<sup>5</sup> Two elements of the argument are particularly persuasive: the methodological angle from which Terpander's poetic *persona* is approached (part III) and the exploration of the different perceptions of Timotheus' works through the ages (part IV sections 11 and 12). Here Power applies to two key figures in the history of *kitharōidia* a recently established exegetical trend: that is, explaining the reasons behind the differences in the reception of a given poet (or poetic *persona*) over time. Until now, Terpander and Timotheus have not been subjected to such an analysis, and it is all the more welcome inasmuch as—scantiness of their surviving texts notwithstanding—it successfully enhances our appreciation of the pivotal and long-lasting importance of their work. Both poets (and the poetic traditions associated with their

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Stesichorus, in: True, M. et al. (eds.), *Papers on the Amasis Painter and His World* (Malibu, Ca.), 43-62, duly mentioned in the book.

<sup>3</sup> See Gostoli, A. (ed.). 1990. *Terpander. Introduzione, testimonianze, testo critico, traduzione e commento* (Rome), duly mentioned in the book.

<sup>4</sup> Power uses Homer as his main *comparandum* (see West, M. 1999. *The Invention of Homer*, CQ 49, 43-65, and Graziosi, B. 2002. *Inventing Homer*, (Cambridge)); possibly also worth mentioning would have been the lyrical case of Sappho, see e.g. Yatromanolakis, D. 2007. *Sappho in the Making: The Early Reception* (Cambridge, Mass.).

<sup>5</sup> Only one significant typo stands out, which is the misspelling of Part IV's title on p. 423 and in the running headers throughout Part IV.



*personae*) regain their rightful place as everlasting paradigms to which citharodes of all epochs made constant reference.

On the other hand, in his attempt to reconstruct the heroic subjects of the lost citharodic repertoire Power sometimes overdoes it and reaches more dubious conclusions. For example, one could wonder whether Sappho's fr. 44 actually derives from an Aeolic citharodic tradition on Iliadic subjects, or represents Sappho's own rendition of a very widely spread tale told in various poetic or other media throughout Greece; the same holds for the way in which Power tries to connect Vergil's Orpheus *Threicia fretus cithara* to a lost, ancient citharodic song on Orphic *katabasis*, and not to the generic, well known image of Orpheus as one of the mythical proto-citharodes. Also questionable is the assumption that Stesichorus and the later "triadic poets" performed chorally, while reflecting monodic, and properly citharodic, features: the issue at stake here has been much debated, at least from the *editio princeps* of the Lille Stesichorus on, and further defense of his position, plausible though it may be, would have been advisable on Power's part, especially in connection with the complex mirroring system he envisages between *kitharôidia* and Stesichorean performance format.

However, there is no doubt that the complex of direct and indirect literary sources, iconographic material, archaeological evidence and historical remarks brought together in Power's analysis offer the most complete picture we currently have of citharodic technical and professional practice, together with its cultural significance and its sociopolitical effects. The book will certainly remain a major reference-point on *kitharôidia* for many years to come.

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Huffman, C.A. 2012. *Aristoxenus of Tarentum. Discussion*, New Brunswick and London, Transaction Publishers. xviii, 382 pp. Pr. \$59.95 (hb). ISBN 9781412843010

A series like the RUSCH, principally dedicated to the most prominent members of the Lyceum, could not be without a volume on Aristoxenus of Tarentum. Indeed, it seems that Aristoxenus was among the first pupils of the Lyceum, within which he achieved renown and authority, since on the death of Aristotle he could aspire to succeed him at the head of the school, as a debated tradition recounted in the lemma dedicated to him in the *Suda* would have us believe. From this lemma we also learn that Aristoxenus was an author of copious production (some 453 works!), which also shows a notable wealth of interests: music, philosophy, history, etc. The contributions in this volume, in part the fruits of a conference held at DePauw University in September 2009, take into consideration only part of Aristoxenus' vast production, as the Editor explains in his brief preface, namely the two areas (music and biography) for which Aristoxenus was best known in antiquity and between which, it should be noted, points of contact emerge. A notable example, for instance, is the distinctive empiricism of Aristoxenus' approach both to the study of music and to the composition of biographies. It is S. Schorn, in the essay contained in this volume, who proposes the definition of 'empiricist' for a biographer like Aristoxenus, in that, more than using the existing literary traditions concerning the characters about whom he writes, he "carefully collected information, traveled to acquire it and named his sources accurately". Many contributors to this volume point out that Aristoxenus thought it very important that musical theorists should pay close attention to musical practice, or in other words to direct experience, which in the case of music is to be obtained through listening.

Seven of the eleven essays in the volume are dedicated to Aristoxenus as a theorist and scholar of music. Of these, some (the two contributions of A. Barker and that of E. Rocconi) address general questions: for instance throwing light on Aristoxenus' motivations when he deals with music of previous epochs, and therefore about what his priorities were (A. Barker); reconstructing Aristoxenus' position within the tradition, widespread in the philosophical thought of antiquity, according to which music had psychological (that is psychagogical) effects on the listeners (E. Rocconi); and identifying whether and which relationships existed between Aristoxenus' musical doctrines and the reflections on music which matured within the Academy, above all those of Plato, and also those of his first successors (Speusippus and Xenocrates) at the head of the school (A. Barker). Focusing on some particular passages and fragments of Aristoxenus, as well as on sections of Pseudo-Plutarch's *De musica* for which a derivation from Aristoxenus may be hypothesised even though he is not named, the other contributions treat specific questions: the procedure, illustrated by Aristoxenus in *Harm.* II 56,13-58,5 Meibom, for measuring the interval of the fourth present in all the tetrachords, independently of their *genos* (D. Creese); Aristoxenus' attribution to the Pythagoreans, in the very short fragment 26 Wehrli, of the belief that music could exercise a therapeutic action on the soul (A. Provenza); and the possibility of using some chapters with an Aristoxenian influence in the *De musica* as trustworthy evidence for trying to shed light on that "black hole" which is the musical scene in the Greece of the IV century BC (T. Power). Finally, the contribution of W.W. Fortenbaugh also has something to do with Aristoxenus *mousikos*: it is an instructive example of a philological

analysis of a fragmentary text (Thphr. Fr. 426A FHS&G), which contains an anecdote about Aristoxenus himself that exemplifies the trust he had in the psychotherapeutic properties of music, something which is also documented in other sources.

In some cases, the essays whose contents I have summarized offer the first extended treatments of certain subjects and texts. They often call widespread opinions into question too: A. Barker, for example, expresses doubts about the normally accepted notion that what Aristoxenus says about the music of previous epochs was founded on a careful historically-oriented examination of the available information.

Contradicting consolidated opinions even more, however, are the contributions contained in the volume regarding Aristoxenus' biographies, known to us only in fragments. Through the analysis of the evidence about Aristoxenus' activity as a biographer and the surviving fragments of his *Lives* (those of the *Life of Socrates* and the *Life of Plato*), these contributions (those of S. Schorn, C.A. Huffman, J. Dillon), require us to re-assess the judgement of these texts which dominates the history of scholarship, according to which they were not a little biased, influenced as they were by Aristoxenus' attitude towards the people about whom he writes, presented either in a uniformly positive light (Pythagoras and Archytas) or a uniformly negative light (Socrates and Plato). In particular, once investigated in the light of parallel traditions, and also using the principal methodological advances now employed in the study of the so-called 'indirect tradition', the preserved fragments do not appear to contain traces of disrespectful malevolence, of a desire to denigrate Socrates and Plato, which many critics have attributed to Aristoxenus and used as a starting point for contemplating the possible reasons for his supposedly anti-Socratic and anti-Platonic attitudes. The theme of L. Zhmud's essay is Aristoxenus' evidence regarding Pythagoras and more generally the Pythagorean experience; on the one hand it claims that this evidence was tainted by polemical intentions and partisanship and is not always credible (especially regarding doctrinal aspects of Pythagoreanism), and on the other shows its importance, which is due to the fact that Aristoxenus' own biography (he was brought up in the Pythagorean setting of Tarentum and knew the so-called 'last Pythagoreans') gave him information in *Pythagoricis* which is greater, and especially more varied, than that of other sources.

An index *locorum* and general index complete the volume, which constitutes a solid step ahead in the attempt, undertaken by recent historiography, to reconstruct the complex figure of Aristoxenus as a whole: a multifaceted thinker, in whom differing philosophical traditions intersect and leave traces, without his being completely and dogmatically committed to any of them (as was shown many years ago by A. Momigliano and is restated most clearly in the essay of L. Zhmud). The essays in this volume, with their wealth of suggestions and stimuli for new research and, above all, with the chances that they indicate for widening the *corpus* (by including texts in which Aristoxenus' name is not mentioned, but which contain many indications that they draw on his work), can only increase our eager anticipation of the new edition of the fragments on which C.A. Huffman is working.

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Silva Barris, J. 2011. *Metre and Rhythm in Greek Verse*. Vienna, Austrian Academy of Sciences. 177 pp. Pr. 39.20 euros. ISBN 978-3-7001-6902-4

Despite Paul Maas' renowned skepticism, Joan Silva Barris sets out in this book to show how the musical rhythms of ancient Greek poetry can be recaptured. We are reminded of the resources we can resort to, if we aim at appreciating the metrical-rhythmical reality of poetic texts from a musical standpoint. There is first an abundant *corpus* of ancient doctrine regarding the theoretical treatment of meters and rhythms, well-known passages taken from Plato, Aristotle and Aristoxenus, up to Hephaestion and Aristides Quintilianus. Secondly, there is the musical evidence, both instrumental and vocal. Thirdly, comparison with other musical cultures might in some cases offer enlightening suggestions.

This multifaceted and unfamiliar subject is divided by the author into three parts. The first part (*Relative Basic Durations and Syllabic Equivalences*, 13-55) illustrates how most of ancient Greek theory is applicable to the metrics of archaic and classical texts. SB observes that all rhythmic genres, whether recited or sung, are studied by ancient theory using analogous assumptions, and it is never indicated that the doctrine ought to be applied in a different manner depending on the performance-practices associated with each genre. It therefore seems acceptable to approach sung and recited rhythms by similar methods. SB outlines the principles of ancient theory by describing the three main rhythmic genres: the dactylic (*isos logos*, ratio 1:1), the iambic (*diplosios logos*, ratio 1:2) and the cretic-paeonic (*hemiolios*, ratio 3:2). An important notion he clarifies is that of the *πρώτος χρόνος*, which is closely examined in Aristoxenus' discussion of the basic structure of rhythm. It is clearly defined as the minimum *relative* subdivision of time. SB then dwells upon the concept of *πούς* ('foot') which is, according to Aristoxenus, the minimum rhythmic unit; it consists of two parts known as *ἄνω* and *κάτω* or *ἄρσις* and *θέσις*, which vary in their relative durations. Though it is difficult to identify the way in which the difference between the two parts of the foot was in fact made audible, SB accepts that the *κάτω* would normally constitute the part that occupied the longer *χρόνος*. Suggestive hints about the rhythmical implementation of given metrical sequences are offered by external *responso*, to which he gives considerable attention. He invokes Aristoxenus' *El. Harm.* II.33-4 and *El. Rh.* 27, in order to make it clear that the same temporal space can be occupied by feet which have very different *schemata* ('shapes') or *diaireseis* ('divisions'). For instance, the same length can be represented by  $\sim\sim$ ,  $\sim-$ ,  $--$  or even  $\sim\sim$ . The important thing here is to recognize that the syllable is not a measure, but a variable quantity. This means that  $-$  and  $\sim$  are variable quantities, like the quarter-note (crotchet) and eighth-note (quaver) in modern musical terminology. Further, whereas the relation between a crotchet and a quaver in a given context is always the same, that between a long and a short syllable is not. In this respect, I am puzzled by SB's use of modern symbols which equate a two-time syllable with a crotchet and a one-time syllable with a quaver. Since the relations between long and short syllables can vary even within the immediate context in which they appear, if the length of a long syllable is consistently represented by a crotchet, the short syllables' values should be represented as lengths varying between a quaver and a semiquaver.

As regards the relation between *arsis* and *thesis* in individual cases, one can assume that it remains the same within the same metrical and rhythmical chain. Another important point is that music in performance could protract a single long syllable, whose basic value is

of two time units (—), to a three-time (—), a four-time and even five-time units value (—, —). Altogether, one should not rule out the possibility that two syllabic groups in responsion, which are apparently divergent in their hypothetical divisions into πρώτοι χρόνοι, might embody equal durations. Crucial questions are raised also by the presence of κενοὶ χρόνοι ('empty times or beats') with a rhythmic value, whose action SB is inclined to assume wherever a clear interruption in verbal continuity is combined with the phenomenon of *catalexis*, though this is not in my opinion the only situation in which empty beats can occur. In the following paragraphs, he speculates on the concept of *catalexis*, and then deals with responsion between short and long syllables in the *positio anceps*.

In the second part (*Rhythmic Value of Traditional Poetic-Musical genres*, 56-149), the rhythmic values in the different traditional genres of song are catalogued. As regards Aeolic lyrics, SB fluctuates between the ancient and modern scholarly traditions. He explores the possible values of the syllabic groups present in the 'Aeolic base'. With regard to the disputed question of Aeolic Dactyls, he believes that they were true dactyls, even while being associated with the metrically variable Aeolic base, in accordance with the ancient tradition. Among Ionic meters conforming to the current paradigm, he does not include the Ionics *a maiore*. When considering dochmii, he dwells on the possible rhythmical values of the syllable in the fourth position, which may (from a metrical perspective) be either short or long. What he says is weakened by the fact that he does not consider the actual dochmiac *schemata* attested in the manuscript tradition; for instance, it is not true that in the first position of the group there is "virtual absence of resolutions" (cf. Gentili, B. and Lomiento, L. *Metrica e Ritmica. Storia delle forme poetiche nella Grecia antica* (Milan 2003), 230, no's. 14, 16, 18, 32, 35, 38). Moreover, what he affirms about the virtual nonexistence of resolutions in the last position of the final sequence is disproved by the transmitted colometries (cf. *ibidem* 230, no's. 15, 17, 18). For iambo-trochaic lyric SB rightly contemplates the possible existence of an indeterminate number of *trisemoi* durations. The famous Epitaph of Seikilos provides, in this respect, important though somewhat late evidence.

The third part (*Rhythmic Proposals for some metrically compound passages*, 150-71) offers concrete examples of what has been discussed throughout the previous chapters. A selection of songs is analyzed from a rhythmical (as opposed to a metrical) perspective. Even if one would not endorse every one of SB's proposals, the thesis that a certain metrical design could in fact be rhythmically realized in a different pattern from the one suggested by the meter is clearly important; and it reminds us that ancient Greek poetry is to be performed to the notes of a musical scale, and not merely read with dynamic accents. He could have been at times more conscious of previous bibliography dealing with the same subject, and more consistent in dealing with ancient sources. Still, his study should be heartily welcomed by every scholar who aims at a more accurate approach to the performance of ancient Greek songs.\*

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